ANNAMALAI UNIVERSITY

Syllabi for the Affiliated Colleges

BACHELOR OF ARTS

DEGREE COURSE

B.A. TAMIL

CBCS PATTERN

(2021-2022)

The Course of Study and the Scheme of Examination

S.		Study Comp	oonents	Ins.					
No.	Part	Course 1	Title	Hrs Credit /week		Title of the Paper	Maximum Marks		rks
SEMESTER I				CIA	Uni.Exam	Total			
1	Ι	Language	Paper-1	6	4	தமிழ்/பிறமொழிகள்	25	75	100
2	П	English (CE)	Paper-1	6	4	Communicative English I	25	75	100
3	111	Core Theory	Paper-1	5	3	இக்கால இலக்கியம் (கவிதை, உரைநடை, நாடகம், புதினம், சிறுகதை)	25	75	100
4	Ш	Core Theory	Paper-2	5	3	இலக்கணம் - 1 நன்னூல் (எழுத்ததிகாரம்)	25	75	100
5	Ш	ALLIED – 1	Paper-1	6	3	தமிழக வரலாறும் பண்பாடும்	25	75	100
6	Ш	PE	Paper-1	6	3	Professional English I	25	75	100
7	IV	Environment Studies		2	2	சுற்றுச் சூழல் பிரிவுகள்	25	75	100
TOTAL 36 22				22		175	525	700	
		SEME	STER II				CIA	Uni. Exam	Total
8	Ι	Language	Paper-2	6	4	தமிழ்/பிறமொழிகள்	25	75	100
9	Ш	English (CE)	Paper-2	6	4	Communicative English II	25	75	100
10	Ш	Core Theory	Paper-3	4	3	இக்கால இலக்கியம் (கவிதை, உரைநடை, நாடகம், புதினம், சிறுகதை)	25	75	100
11	111	Core Theory	Paper-4	4	3	இலக்கணம் - 2 நன்னூல் (சொல்லதிகாரம்)	25	75	100
12	III	ALLIED – 1	Paper-2	6	5	தமிழக வரலாறும் பண்பாடும்	25	75	100
13	III	PE	Paper-1	6	3	Professional English II	25	75	100
14	IV	Value Education		2	2	மதிப்புக் கல்வி	25	75	100
15	IV	Soft Skill		2	1	Soft Skill	25	75	100
			TOTAL	36	25		200	600	800
						1			

திருவள்ளுவர் பல்கலைக்கழகம்

இளங்கலைப் பட்டப்படிப்பு தமிழ்

2020-2021 ஆம் கல்வியாண்டு முதல் நடைமுறைப்படுத்தப்படும்

பாடத்திட்டம் (CBCS) B.A. Tamil Syllabus (CBCS)

முதல் ஆண்டு

முதல்பருவம்

தாள் 1

இலக்கியம் I

இக்கால இலக்கியம் I

(கவிதை, உரைநடை, நாடகம், புதினம், சிறுகதை)

அலகு 1	:	கவிதை	
		1) பாரதியார் கவிதைகள்	
		1. பாரததேசம் - 2. தமிழ் -	13 பாடல்கள், 4 பாடல்கள்
		2) பாரதிதாசன் கவிதைகள் -	தமிழியக்கம், (பாவை பப்ளிக்கேஷன்ஸ்,
சென்னை)			
அலகு 2	:	உரைநடை	
கொகுப்ப		முனைவர்.மு.கருப்புசாமி -	தமிழ்த்தோ் (உரைநடை
			பாவைப்பதிப்பகம், மதுரை.
அலகு 3	:	நாடகம் கண்ணதாசன் -	மாங்கனி (கவிதைநாடகம்)
அலகு 4	:	புதினம் இமயம் -	ஆறுமுகம்
அலகு 5	:	சிறுகதை மண்மணக்கும் கதைகள் -	தொகுப்பாசிரியர் முனைவர் பா. சிங்காரவேலன்

தாள் 2

இலக்கணம் I

நன்னூல் - எழுத்ததிகாரம்

பாடநூல் : நன்னூல் - எழுத்ததிகாரம் காண்டிகை உரை – ஆறுமுக நாவலர் (முல்லை நிலையம், சென்னை – 1, பதிப்பு, 2008.)

- அலகு 1 : பாயிரம்
- அலகு 2 : எழுத்தியல்
- அலகு 3 : பதவியல்
- அலகு 4 : உயிரீற்றுப் புணரியல்
- அலகு 5 : மெய்யீற்றுப் புணரியல், உருபு புணரியல்

சார்புப்பாடம் - 1

தாள் 1

தமிழக வரலாறும் பண்பாடும் - 1

பாடநூல் :		தமிழக டாக்டர் உலக _் தரமண	ைவரலாறும் மக்கள் பண்பாடும், டகே.கே. பிள்ளை, த் தமிழாராய்ச்சி நிறுவனம், ரி, சென்னை — 600 113.
அலகு 1	:	1) 2) 3) 4)	தமிழக வரலாற்றுக்கான அடிப்படை ஆதாரங்கள் தமிழகத்தின் இயற்கை அமைப்புகள் வரலாற்றுக் காலத்துக்கு முந்திய தமிழகம் சிந்துவெளி அகழ்வாராய்ச்சி
அலகு 2	:	5) 6)	பண்டைத் தமிழரின் அயல்நாட்டுத் தொடர்புகள் தமிழ் வளர்த்த சங்கம்
அலகு 3	:	7) 8)	சங்க இலக்கியம் பண்டைத் தமிழரின் வாழ்க்கை
அலகு 4	:	9)	களப்பிரர்கள்
அலகு 5	:	10) 11)	பல்லவர்கள் தமிழகத்தில் நான்காம் நூற்றாண்டு முதல் ஒன்பதாம் நூற்றாண்டு வரை சமூக நிலை

பார்வைநூல்கள் :

1.	வே.தி. செல்லம்,	தமிழக வரலாறும் பண்பாடும், மணிவாசகர் பதிப்பகம், சென்னை — 600 108.
2.	டாக்டர் ந.க.மங்களமுருகேசன்	தமிழக வரலாறும், பண்பாடும் சாரா பப்ளிஷர்ஸ், திருச்சி.

இரண்டாம் பருவம்

தாள் 3

இலக்கியம் 2

இக்கால இலக்கியம் 2

(கவிதை, உரைநடை, நாடகம், புதினம், சிறுகதை)

அலகு	1	:	கவிதை		
			வைரமுத்து	-	இன்னொரு தேசீய கீதம்
அலகு 2	2	:	உரைநடை		
			சுந்தரராமசாமி	-	காற்றில் கலந்த பேரோசை
அலகு 🤅	3	:	நாடகம்		
			ஜெயந்தன்	-	நினைக்கப்படும்
<u></u> அலகு 4	4	:	புதினம்		
			பிரபஞ்சன்	-	மகாநதி
அலகு :	5	:	சிறுகதை		
			சிறுகதைத் தொகுப்பு	-	ரிஷி பப்ளிகேஷன்ஸ் கோயம்புத்தூர்.

தாள் 4

இலக்கணம் 2

நன்னூல் - சொல்லதிகாரம்

- பாடநூல் : நன்னூல் சொல்லதிகாரம் காண்டிகை உரை - ஆறுமுக நாவலர் (முல்லை நிலையம், சென்னை-1, பதிப்பு-2008)
- அலகு 1 : பெயரியல்
- அலகு 2 : ഖിனையியல்
- அலகு 3 : பொதுவியல்
- அலகு 4 : இடையியல்
- அலகு 5 : உரியியல்

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சார்புப்பாடம் - 1

தாள் 2

தமிழக வரலாறும் பண்பாடும் - 2

பாடநூல் :		தமிழக டாக்ட உலக தரமன	க வரலாறும் மக்கள் பண்பாடும், ர் கே.கே. பிள்ளை, த் தமிழாராய்ச்சி நிறுவனம், গி, சென்னை — 600 113.
அலகு 1	:	1) 2) 3)	சோழப் பேரரசின் தோற்றம் சோழப் பேரரசின் வளர்ச்சியும் வீழ்ச்சியும் சோழர் காலத்தில் தமிழரின் சமுதாயம்
அலகு 2	:	4)	பாண்டியரின் தோற்றமும் வீழ்ச்சியும்
அலகு 3 நிலை	:	5) 6)	மதுரை நாயக்கர்கள் தமிழகத்தில் 13 முதல் 18 ஆம் நூற்றாண்டு வரை சமூக
அலகு 4 சமூக	:	7) 8)	ஐரோப்பியரின் வரவு பத்தொன்பதாம் நூற்றாண்டின் அரசியலும் தமிழகத்தின் நிலையும்
அலகு 5	:	9)	இருபதாம் நூற்றாண்டில் தமிழகம்

அண்ணாமலைப் பல்கலைக்கழகம்

தமிழியல் (MA. Tamil) 2021 - 2022

Sl.no		Study Components	Ins .hrs/	Credit	Title of the paper	Maxii	num ma	rks
		Course Title	Week			CIA	Uni	Total
	Semester I						Exam	
1.	core	PAPER-1	6	4	இக்காலஇலக்கியம்	25	75	100
2.	Core	Paper-2	6	4	அறஇலக்கியம்	25	75	100
3.	Core	Paper-3	6	4	தொல்காப்பியம்-எழுத்ததிகாரம்	25	75	100
4.	Core	Paper-4	6	4	தமிழ்பண்பாட்டுவரலாறு	25	75	100
5.	Core elective	Paper-1	3	3	1.மொழியியல் அறிமுகம் (அ) 2.தொல்லியல்	25	75	100
6.	Open Elective	Paper-1	3	3	1.இதழியல் தமிழ் (அ) 2.பேச்சுக்கலை	25	75	100
			30	22		150	450	600
	Semester II					CIA	Uni	Total
		-					Exam	
7.	core	PAPER-5	6	4	காப்பியங்கள்	25	75	100
8.	Core	Paper-6	6	4	பக்திஇலக்கியம்	25	75	100
9.	Core	Paper-7	6	4	தொல்காப்பியம் - சொல்லதிகாரம்	25	75	100
10.	Core Elective	Paper -2	5	3	1.சைவசித்தாந்தம் (அ) 2.பெண்ணியப்படைப்புகள்	25	75	100
11.	Open Elective	Paper -2	5	3	1.ஊடகத்தமிழ் (அ) 2.நாடகத்தமிழ்	25	75	100
12.	*Field study		-	2		100	-	100
13.	Compulsory Paper		2	2	Human Rights	25	75	100
			30	22		250	450	700

* FIELD STUDY

There will be field study which is compulsory in the first semester of all PG courses with 2 credits. This field study should be related to the subject concerned with social impact. Field and Topic should be registered by the students in the first semester of their study along with the name of a mentor before the end of the month of August. The report with problem identification and proposed solution should be written in not less than 25 pages in a standard format and it should be submitted at the end of second semester. The period for undergoing the field study is 30 hours beyond the instructional hours of the respective programme. Students shall consult their mentors within campus and experts outside the campus for selecting the field and topic of the field study. The following members may be nominated for confirming the topic and evaluation the field study report.

- (i). Head of the respective department
- (ii). Mentor
- (iii). One faculty from other department

முதுகலை தமிழியல் நடைமுறை 2021 - 22 முதலாமாண்டு முதல் பருவம்

தாள் -1

இக்கால இலக்கியம்

கூறு 1 கவிதை	
1.பாரதியார்	கண்ணம்மா என் குழந்தை
2. பாரதிதாசன்	தமிழியக்கம் - நெஞ்சு பதைக்கும் நிலை
3. அறிவுமதி	நட்புக்காலம்
4. கவிஞர் பச்சியப்பன் கூறு -2 புதினம்	மழைபூத்த முந்தானை
சஞ்சாரம் -	எஸ் . இராமகிருஷ்ணன், தேசாந்திரி பதிப்பகம், சென்னை
கூறு - 3, சிறுகதை	
ஊர்ப்பிடாரி -	கவிப்பித்தன் - பாரதி புத்தகாலயம், சென்னை
கூறு - 4 நாடகம்	
வலி அறுப்பு -	மு.இராமசாமி, அகரம் பதிப்பகம், தஞ்சாவூர்
கூறு - 5 கட்டுரை	
சங்க இலக்கியம் சில	பார்வை - டாக்டர் சி .பாலசுப்பிரமணியன், பாரிநிலையம்
சென்னை	
இரா வல்லிக்கண்ணன்	புதுக்கவிதை தோற்றமும் வளர்ச்சியும், எழுத்துப்
	பிரசுரம், சென்னை
பாலா மன்னர்மன்னன் நிர்மலா சுரேஷ் நா வானமாமலை	புதுக்கவிதை ஒரு பார்வை கறுப்புக்குயிலின் நெருப்புக்குரல் தமிழில் ஹைக்கூ கவிதைகள் புதுக்கவிதைை -முற்போக்கும் பிற்போக்கும்
ந.சுப்புரெட்டியார்	புதுக்கவிதை போக்கும் நோக்கும்

ஜெயமோகன்	நவினத் தமிழிலக்கிய அறிமுகம்		
மா.இராமலிங்கம்	இருபதாம் நூற்றாண்டுத	தமிழ் உரைநடை தமிழ்ப் புத்தகாலயம்	
	пл	2	
	தாள	2	
	அற இலக்	கியம்	
கூறு -1 திருக்குறள்			
அறத்துப்பால் -	இனியவை சு பயனிலசொல்	றல், நடுவு நிலைமை, புறங்கூறாமை , லாமை, வாய்மை	
பொருட்பால்	- வலியறிதல் அவையறிதல்	, காலமறிதல், இடனறிதல், குறிப்பறிதல், ,	
இன்பத்துப்பால் - ஊடலுவகை	நலம்புனைந்துரைத்த	ல் காதற்சிறப்புரைத்தல், புலவி,	
கூறு - 2			
நாலடியார் அறன்	வலியுறுத்தல் 31-40	வரை	
மேன்ம	க்கள் 151 -	160 வரை	
இனியவை நாற்பது	11-20	ഖത്യ	
இன்னாநாற்பது	16-25	ഖത്യ	
ஆசாரக்கோவை	41-50	ഖത്യ	
பழமொழிநானூறு	1-10	வரை(கல்வி பற்றிய பாடல்)	
கூறு - 3			
அறநெறிச்சாரம் (முன	னப்பாடியார்)	கற்றவர்க்குரிய நெறி 71-80 பாடல் வரை	
நல்வழி (ஓளன	வயார்)	பாடல் எண் 11-15 வரை	
		(ஒருநாள் உணவை எனத்தொடங்கும் பாடல் முதல் சிவாயநம எனும் பாடல் வரை	
கூறு -4			
நன்னெறி (சிவப்பிரகா	சர்) பாடல் கொல் வரை)	் 21 -30 (எழுத்தறியார் கல்வி - முதல் - லும் கொடுங்கூற்றம் என முடியும் பாடல்	
நீதி நெறி விளக்கம்(«	தமரகுருபரர்) பாடல் எனத் வன்) 51 -60(உலையா முயற்சி தொடங்கும் பாடல்முதல் பொய் குறளை சொல் என முடியும் பாடல் வரை)	

கூறு - 5

நரிவிருத்தம்

பாடல் 1-10 (பால்நிலா மதியம் எனத்தொடங்கும் பாடல் முதல் - சுற்றில் ஆர் வல்லில் என முடியும் பாடல் வரை

மூதுரை

பாடல் 1-10(நன்றி ஒருவருக்கு எனத்தொடங்கும் பாடல் முதல் நெஞ்சுக்கு இறந்த பாடல் வரை)

தாள் 3

தொல்காப்பியம் - எழுத்ததிகாரம்

கூறு	1	:	நூன்மரபு, மொழிமரபு, பிறப்பியல்
கூறு	2	:	புணரியல், தொகைமரபு
கூறு	3	:	உருபியல், உயிர் மயங்கியல்
கூறு	4	:	புள்ளி மயங்கியல்
கூறு	5	:	குற்றியலுகரப் புணரியல்

பார்வைநூல்கள்

1.	மு. சண்முகம் பிள்ளை (ப.ஆ)	:தொல்காப்பியம் எழுத்ததிகாரம்,
		184, பிராட்வே, முல்லை நிலையம்,
		சென்னை — 600 113.
2.	ஆ. சிவலிங்கனார் :	தொல்காப்பியம் எழுத்ததிகாரம் (உரை
		வளங்கள்) உலகத் தமிழாராய்ச்சி நிறுவனம்,
		தரமணி, சென்னை – 608 113.
3.	கு. சுந்தரமூர்த்தி (ப.ஆ)	:தொல்காப்பியம் எழுத்ததிகாரம்,
		அண்ணாமலைப் பல்கலைக்கழகம்,
		அண்ணாமலை நகர் - 608 002,
		1986.
4.	செ.வை. சண்முகம் பிள்ளை :	எழுத்திலக்கணக் கோட்பாடு,
		உலகத் தமிழாராய்ச்சி நிறுவனம்,
		தரமணி, சென்னை – 608 113.
5.	தி. முருகரத்தினம் :	தமிழ் எழுத்தியல் அன்றும் இன்றும்,
		மதுரைப் பல்கலைக்கழகம்,

			சர்வோதய இலக்கியப் பண்னை,
			மதுரை — 625 001,
6. 7.	ச. பாலசுந்தரனார் டாக்டர் மு. ஹம்சா	:	தொல்காப்பியம் - எழுத்ததிகாரம் - ஆராய்ச்சிக் காண்டிகையுரை, பெ. மாதையன் (ப.ஆ),பெரியார் பல்கலைக்கழகம், சேலம் - 636 011. 2014. தொல்காப்பியரின் எழுத்திலக்கணக்
			கோட்பாடுகள், ராபியா பதிப்பகம், சக்தி கார்டன்ஸ், சேலையூர்,
			சென்னை — 73, 2004.
8.	ச.வே. சுப்பிரமணியம் (ப.ஆ)	:	தொல்காப்பிய உரைவளக் கோவை,
			மெய்யப்பன் பதிப்பகம், சிதம்பரம், 2009.
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10.	வ.சுப. மாணிக்கம்	:	தொல்காப்பியக் கடல்,
			மணிவாசகா் பதிப்பகம், சிதம்பரம், 1987.
11.	வ.சுப. மாணிக்கம்	:	தொல்காப்பியத் திறன்,
			மணிவாசகா் பதிப்பகம், சிதம்பரம், 1984.
12.	க. வெள்ளைவாரணன்	:	தமிழ் இலக்கிய வரலாறு — தொல்காப்பியம்,
			அண்ணாமலைப் பல்கலைக்கழகம், சிதம்பரம், 1970.
13.	செ.வை. சண்முகம்	:	எழுத்திலக்கணக் கோட்பாடு,
			அனைத்திந்திய மொழியியல் கழகம்,
			அண்ணாமலைநகர், 1980.
14.	சோ.ந. கந்தசாமி	:	தொல்காப்பியத் தெளிவு,
			அபிராமி பதிபப்கம், அண்ணாமலை நகர்,
			1977.
15.	சி.இலக்குவனார்	:	தொல்காப்பியத் தெளிவு,
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			1961.
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			உலகத் தமிழாராய்ச்சி நிறுவனம், சென்னை, 1992.
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		பாரி நிலையம், சென்னை. 1975.
18. ச. அகத்தியலிங்கம்	:	தொல்காப்பிய உருவாக்கம், மெய்யப்பன் தமிழாய்வகம், சிதம்பரம், 2001
19. ப. அருணாசலம்	:	தோல்காப்பியா்,
20. ச. பாலசுந்தரம்	:	தமிழ்ப் புத்தகாலயம், சென்னை, 1975. எழுத்திலக்கணக் கலைச்சொற் பொருள்விளக்க அகராதி, தாமரை வெளியீட்டகம், 367, மேலவிதி, தஞ்சாவூர் - 631 009.
		1998.
21. தி.வே. கோபாலையர்	:	தமிழிலக்கணப் பேரகராதி, தமிழ்மண் பதிப்பகம், தி.நகர், சென்னை – 17, 2005.

தாள் -4

தமிழ்ப் பண்பாட்டு வரலாறு

கூறு	1	:	வரலாற்றுக்கு முந்தைய காலம் : பழைய கற்காலம் - புதிய கற்காலம்
			- சிந்துவெளி மனித இனவளர்ச்சி — கலைகள் உருவாக்கம் - பண்பாட்டு வரலாறு — சங்ககாலம்.
கூறு	2	:	தமிழர்நிலை : களப்பிரர் காலம் - பல்லவர் காலம் - சோழர் காலம் -
			பாண்டியர் காலம் - நாயக்கர் காலம் - நவாபுகள் காலம் - ஐரோப்பியர்காலம்.
கூறு	3	:	நீதி இலக்கியம் - சமய மரபு — நீதி, அறம் வடமொழித் தாக்கங்கள் -
			பக்தி இலக்கியம் - பண்பாட்டுப் பரவல் - பண்பாட்டுச் சேர்க்கை —
			பக்தி வழி உருவான பண்பாட்டுத் தன்மைகள்.
கூறு	4	:	நுண்கலைகள் - இசை — ஒவியம் - சிற்பம் - கட்டடம் - பண்பாட்டுக்
			கூறுகளைக் காணல் - காலந்தோறும் நுண்கலைகள் - வரலாற்றுப்
			போக்கில் நுண்கலைகள் வழி வெளிப்படும் பண்பாட்டுக் கூறுகளைக்
			கண்டறிதல்.
கூறு	5	:	இருபதாம் நூற்றாண்டில் ஊடகங்கள் வழிப் பண்பாட்டைக் காணுதல் -
			வாய்மொழி — அச்சு — பார்த்தலும் கேட்டலும்.

பார்வை நூல்கள்:

1.	க.த. திருநாவுக்கரசு	:	தமிழர் நாகரிக வரலாறு, கொல்காப்பியர் நாலகம்
			രളസാഷ്ഥ്വവി ഇസാക്ഥ, ചെങ്ങം – 14 1962
2.	எஸ். இராமகிருஷ்ணன்	:	இந்தியப் பண்பாடும் தமிழரும், மீனாட்சி புத்தக நிலையம்,
3.	மயிலை சீனி. வேங்கடசாமி	:	மதுரை, 1982. தமிழர் வளர்த்த அழகுக் கலைகள், கழகப் பதிப்பு, சென்னை, 1070
4.	கே.கே. பிள்ளை	:	1972. தமிழக வரலாறும் பண்பாடும், உலகத் தமிழாராய்ச்சி நிறுவனம், சென்னை — 113, 2004
5.	எஸ். வையாபுரிப்பிள்ளை	:	தமிழர் பண்பாடு, கழக வெளியீடு, சென்னை – 1, 1974.
6.	வே.தி. செல்வம்	:	தமிழக வரலாறும் பண்பாடும், செல்வி பதிப்பகம், திருச்சி, 1978.
7.	தெ.பொ. மீனாட்சிசுந்தரம்	:	தமிழும் பிறபண்பாடும், நியூ செஞ்சுரி புக் ஹவுஸ், சென்னை – 98, 1980.
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9.	செ. வைத்தியலிங்கம்	:	தமிழ்ப் பாண்பாட்டு வரலாறு, அண்ணாலைபை பல்கலைக்கழக வெளியீடு 1996.
10.	மா. இராசமாணிக்கனார்	:	சிந்துவெளி நாகரிகம், கழக வெளியீடு, சென்னை – 1, 1962.

விருப்பப்பாடம் -**I** 1. மொழியியல் அறிமுகம்

கூறு 1 : மொழியலும் மொழியியல் சார்ந்த விளக்கங்களும் மொழி – வரையறை – விளக்கம் - மொழியியல் பற்றிய சொல் பொருள் விளக்கம், மொழியியல் பிரிவுகள், மொழி – பேச்சு மற்றும்

			எழுத்து முறைகள், மொழியின் கட்டமைப்பு
கூறு	2	:	ஒலியியலும், ஒலியனியலும்
			ஒலியியல் விளக்கம் - பிரிவுகள் - பேச்சு உறுப்புகள் - பேச்சொலி வகைப்பாடு - இணையொலிப்பு, ஒலியனியல் - வரையறை — விளக்கம் - ஒலி — ஒலியன் - மாற்றொலி, ஒலியன் கோட்பாடுகள் - மேற்கூற்றொலியன்.
கூறு	3	:	உருபனியல்
			உருனியல் - வரையறை — விளக்கம் - உருபன் - உருபு
			– மாற்றுருபு – நைடாவின் உருபனைக் கண்டறியும் கொள்கைகள் - மாற்றிலக்கணக் கோட்பாடு – அகவடிவம், புறவடிவம்.
கூறு	4	:	தொடரியல்
			தொடரியல் - வரையறை – சொல் வகைகள் - அண்மையுறுப்பு – விளக்கம் - அண்மையுறுப்பு வகைகள் - தொடரமைப்பு – மாற்றிலக்கணக் கோட்பாடு – அகவடிவம், புறவடிவம்.
கூறு	5	:	பொருண்மையியல்
			பொருள் வகைகள் - சொற்பொருள் மற்றும் இலக்கணப் பொருள், சொற்பொருள் அலகுகள் - சுட்டுப் பொருள், குறிப்புப் பொருள் - பொருட் பன்மொழி — பல பொருள் குறித்த ஒரு சொல், ஒலியமைப்பில் ஒத்த பொருள் மாறுபடும் சொற்கள்.

பார்வை நூல்கள்:

1.	முத்துசண்முகம்	:	இக்கால மொழியியல்,
			பாரி நிலையம், சென்னை - 1
2.	சு. இராசாராம்	:	ஒலியியல்,
			இந்திய மொழிகளின் மத்திய நிறுவனம்,
			மைசூர், முதற்பதிப்பு — 1981.
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			அண்ணாமலை நகர்,
			முதற்பதிப்பு, 1982.
4.	கி. கருணாகரன்	:	மொழியியல்,
			குமரன் பதிபப்கம்,
			சென்னை.
			முதற்பதிப்பு, 1997.
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			தமிழ்ப் பல்கலைக்கழகம்.
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		மாற்றிலக்கணமும் அதன் கோட்பாடுகளும்.
		இந்திய மொழிகளின் மைய நிறுவனம்,
		மைசூர்.
		முதற்பதிப்பு, 1975.
முனைவர் பொற்கோ	:	இக்காலத் தமிழ் இலக்கணம்,
		ஐந்திணைப் பதிப்பகம்,
		சென்னை — 5, 2011.
முனைவர் பொற்கோ	:	பொதுமொழியியல் - ஒர் அறிமுகம்
		சென்னை — 5, 2011.
முனைவர் கு. பரமசிவம்	:	இக்கால மொழியியல்,
		அடையாளம், புத்தாநத்தம், திருச்சி.
பேராசிரியா் இரா. ஜெகதீசன்	:	மொழியின் ஒலி.
		குறிஞ்சி பதிப்பகம்,
		வேலூர்.
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2. தொல்லியல்

கூறு	1	:	தொல்லியல் அறிமுகம்
			தொல்லியலின் பொருள், வரைவிலக்கணம் மற்றும் அதன் முக்கியத்துவம் - வரலாற்றுக்குச் சான்றாகத் தொல்லியல் - தொல்லியல் வகைகள் - தொல்லியலின் செயல் நோக்கம் - தொல்லியலுக்கும் பிற இயலுக்கும் இடையேயான தொடர்பு – தொல்லியலாரின் பணிகள் - சுற்றாய்வு – அரும்பொருட்களைப் பாதுகாத்தல்.
கூறு	2	:	அகழாய்வியல்
			அகழாய்வும் அதன் வகைகளும் - காலவரையறை செய்தல் - தமிழ் நாட்டின் அகழாய்விடங்கள் - காவிரிப்பூம்பட்டினத்தில் அகழாய்வுகள் - உறையூரின் அகழ்வாராய்ச்சி – கேரளத்தில் அகழ்வாய்வுகள் - புரூஸ்புட் தொண்டு
கூறு	3	:	வரலாற்றுக்கு முற்பட்ட காலம்
			மண்ணில் காலமும் பெரும்பனிப்படர்வு காலமும் - கற்காலம் - உலோக காலம் - இந்திய மட்கலப் பண்பாடு - இந்திய தொல்லியல்துறை.
கூறு	4	:	கல்வெட்டியல்
			கல்வெட்டியலின் பொருளும் முக்கியத்துவமும் - கல்வெட்டுகளின் வகைகள் - தொல்லெழுத்தியல் - தமிழ் எழுத்து (அ) தமிழ் பிராமி எழுத்து – வட்டெழுத்து – கிரந்த எழுத்து – கல்வெட்டுகளின் கால நிர்ணயம் - பாண்டியரின் உக்கிரன் கோட்டை – பாண்டிய நாட்டிலுள்ள சில வீரக்கற்கள்
கூறு	5	:	மௌரியர் கால நாணயங்கள் - குஷாணர் கால நாணயங்கள் -

பார்வை	ப நூல்கள் :	சாளுக்கியர் ந நாணயங்கள் விஜயநகர அ நாணயங்கள்	நாணயங் - பல்லவ ரசா் காவ - தமிழ்	கள் - ப வர் நான ல நாண நாட்டிய	பாண்டியர் கால நாணயங்கள் - சேரர் எயங்கள் - சோழர்கால நாணயங்கள் - ரயங்கள் - இந்தியாவில் அயல்நாட்டு பல் அயலக நாணயங்கள்.
1.	பேரா. முனைவ	ர் நா. மாரிசா	மி	:	தொல்லியல் (Archaelogy) பாவை பப்ளிகேஷன்ஸ், 142, ஜானிஜான்கான் சாலை, இராயப்பேட்டை, சென்னை – 600 014, இரண்டாம் பதிப்பு, 2013.
2.	பேராசிரியர் டா கோ.வி. இராம	க்டர் ன்		:	கொல்லியல் அய்வகள்.
					(அகழாய்வு, கல்வெட்டு, நாணயம் பற்றியவை), நியூ செஞ்சுரி புக் ஹவுஸ், அம்பத்தூர், சென்னை – 600 098. முகற்பதிப்பு, 2014.
3.	கோ. சுந்தர் (த	5மிழில்)	:	பவுல்ப அறிமு 1205/1 புத்தந _ி முதந்ப	ான் தொல்லியல் (மிகச் சுருக்கமான கம்), ., கருப்பூர் சாலை, ந்தம் - 621 310, திப்பு, 2007.
4.	பேரா. டாக்டர்				
	கோ. விசய கே (தொ.ஆ)	வணுகோபால்	:	தொல் தொல் பண்பா மதுரை முதா	லியல் ஆய்வுத் தொகுதி, பொருள் தொழில்நுட்பப் பணியாளர் ட்டுக் கழகம், , திப்பு, 1985.
5.	கா. ராஜன்		:	தோல் உலக சென்ன	ையல் நோக்கில் சங்க காலம் ந் தமிழ் ஆராய்ச்சி நிறுவனம், ன — 113.
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Open Elective paper

1. இதழியல் தமிழ்

- கூறு 1 மக்கள் தகவலியல் அறிமுகம் - தன்மையும் - எல்லையும் - தகவல் : தொடர்பு விளக்கம் - செயல்முறை — பத்திரிக்கைத் துறையின் அடிப்படைக் கொள்கைகள் - பத்திரிகைத் துறையினர்க்குத் தேவையான தகுதிகள் - பத்திரிகைத் துறையின் தொழில் அம்சங்கள் - பத்திரிகை வானொலி மிக்க தொடர்பு சாதனம் -விதிகள் ஓர் ஆற்றல் திரைப்படங்கள் - தொலைக்காட்சி நிகழ்ச்சிகள்.
- இதழியல் வரலாறு, தொடக்க காலம் தமிழ் இதழியல் வரலாறு 2 கூறு : வகைகள் - இதழியல் சட்டங்கள், செய்திச் சேகரிப்பும் இதழ்களின் செம்மையாக்கமும் செய்தி ஆசிரியர்கள், துணை ஆசிரியர்களின் -பொதுவான வெளிநாட்டு, பணிகள் உள்நாட்டுச் செய்திகளைப் பெறும்முறை திரட்டும் செய்திகள் -செய்திகளை _ அலைந்து நோ்ப்படுத்துதல்.
- பக்தி அமைத்தலும், நிறுத்தக் குறியிடலும் மொழி நடைக் குறிப்பேடு 3 கூறு : – செய்தி எழுதப்படும் முறை – தலைப்பு வகைகள் - கிளை வரி – தேதி வரி – முகவுரை வகைகள் - உடல்புகுதி – அச்சுப்டித்திருத்தம் -குறியீடுகள் -இதழியல் கலைச்சொற்கள் -கட்டுரைகள் நெகிழ்வுரைகள் மதிப்புரை கருத்துப்படங்களும் _ கேலிச்சித்திரங்களும் வானொலி, தொலைக்காட்சிக்கு எழுதும் -முறைகள்.
- கூறு 4 : விளம்பரத்தின் தத்துவமும் செயல்பாடும் விளம்பர அறங்கள் -இந்திய நாட்டில் விளம்பரங்கள்.

கூறு 5 : மக்கள் உறவியல், சொற்பொருள் விளக்கமும், வரையறையும் -விளம்பரமும் பொதுமக்கள் தொடர்பும் - அரசாங்கமும் மக்கள் தொடர்பு முறைகளும் - திட்டமிடுதல் - முடிவு செய்தல் - மக்கள் தொடர்பு சாதனங்கள்.

பார்வை நூல்கள்:

1.	இரா. கோதண்டபாணி	:	இதழியல்
2.	மா.சு. சம்பந்தன்	:	அச்சுக்கலை,
			தமிழர் பதிப்பகம், சென்னை – 1, 1976.
3.	டாக்டர் வே. தயாளன்	:	மக்கள் தகவல் தொடர்பியல்,
	டாக்டர் வ. ஜெயா	:	ஜெயா பதிப்பகம்,
			9, அண்ணா நகர் முதல் தெரு,
			கோயம்புத்தூர், 1989.
4.	முனைவர் இரா. விஜயராணி	:	தொலைக்காட்சி விளம்பரங்கள்,
			கண்மணி பதிப்பகம்,

		திருச்சி – 17. 2002.
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		மாணிக்கம் பதிப்பகம்.
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8.	இ. சுந்தரமூர்த்தி. :	இந்திய விடுலைக்கு முந்திய தமிழ்
	மா.ரா. குருசாமி	இதழ்கள், உலகத் தமிழாய்ச்சி
	(பதிப்பாசிரியா்கள்)	நிறுவனம், சென்னை, 1998.
9.	டாக்டர் கு. முத்துராசன் :	இதழியல் வளர்ச்சியும் மொழிபெயர்ப்பும்,
		திருவல்லிக்கேணி, சென்னை – 5, 2001.
10.	ம. பா. குருசாமி :	இதழியல் கலை,
		குரு. தேமொழி பதிப்பகம்.
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2. பேச்சுக்கலை

அலகு 1

பேச்சுக்கலை விளக்கம் - கலைகளுள் சிறந்தகலை பேச்சுக்கலையின் தோற்றம் வளர்ச்சி - மேடைப்பேச்சு மேடைப்பேச்சின் விளக்கம்

அலகு 2

இந்தியாவில் மேடைப்பேச்சு தோற்றம் தமிழகத்தில் மேடைப்பேச்சின் தோற்றம் வளர்ச்சி பேச்சாளரின் தகுதிகள்

அலகு 3

பேச்சின் தொடக்கம் - பல்வேறு அறிஞர்களின் கருத்துக்கள் - தொடங்கும் முறை

அலகு 4

சிறந்த பேச்சாளரின் பண்புகள் மேற்கோள்களைப் பொருத்தமுற எடுத்தாளுதல்

அலகு 5

பேச்சை முடித்தல் - பேச்சுக்குறிப்பெடுத்தல் - திறன் வளர்த்தல் - மாணவர்களைப் பேச்சாளராக உருவாக்குதல்

பார்வை நூல்கள்

நீங்களும் பேச்சாளராகலாம்	க.அன்பழகன்	பூம்புகார்	பதிப்பகம்
பேச்சளராக	அ.கி.பரந்தாமன	ளர் பாரிநி	லையம்

பேச்சுக்கலை

நீங்களும் பேச்சாளராகலாம்

இரண்டாம் பருவம்

தாள் 5

காப்பியங்கள்

கூறு	1	:	சிலப்பதிகாரம்	-புகார்க்காண்டம் (மங்கல வாழ்த்து முதல்
			இந்திர விழவு	எடுத்த காதை வரை)
			மணிமேகலை அறிவித்த காச	(பாத்திரம் பெற்ற காதை முதல் -ஆபுத்திரன் திறம் தை வரை)
கூறு	2	:	பெரியபுராணம்	: மெய்ப்பொருள்நாயனார்புராணம்
கூறு	3	:	கம்பராமாயணப	ம் : அயோத்தியா காண்டம் மிதிலைக்காட்சிப் படலம்
கூறு	4	:	தேம்பாவணி	முதற்காண்டம் - நாட்டுப்படலம்
கூறு	5	:	சீறாப்புராணம்	ஹிஜிறத்துக் காண்டம் - விடமீட்ட படலம்
பார்வை	ப நூல்க	5ள்:		
1.	வ.சுப.	மாணிக்	கம் :	இரட்டைக் காப்பியங்கள், செல்லப்பா பதிப்பகம். மீனாட்சி புத்தக நிலையம் (விற்பனை உரிமை),
				மதுரை – 625 001, 2007.
2	. மு.	வரதராச	னார்	:இளங்கோ, கண்ணகி, மாதவி(மூன்று நூல்கள்)
				பாரிநிலையம், சென்னை — 108
3.	தெ.பெ	ா. மீனா၊	்சி சுந்தரனார்	க்கள்கள் காப்பியம், மீனாட்சி புத்தக நிலையம், மதுரை — 625 001,
				1974.
4.	அ.ச. (ஞானசம்	பந்தன் :	கம்பன் - புதிய பார்வை, கம்பன் கழக வெளியீடு, வானதி பதிப்பகம், தி. நகர்,
				சென்னை — 17, 1984
5.	கி.வா.	ஜகந்நா	தன் :	தமிழ்க் காப்பியங்கள்,

	அமுத நிலையம், இராயப்பேட்டை ஹைரோடு, சென்னை — 14, 1971.
	தாள் -6
	பக்தி இலக்கியம்
கூறு 1 :	
1) திருஞானசம்பந்தர் தேவாரம்	மண்ணில் நல்ல வண்ணம் வாழலாம்
	முதல்திருமுறை – திருக்கழுமலம் பதிகம்.
	(1-11 பாடல்கள்)
2) திருநாவுக்கரசர் தேவாரம் -	மாதா்ப்பிறைக்கண்ணியானை - ஐந்தாம்
	திருமுறை — திருவையாறு பதிகம்
	(1-10 பாடல்கள்)
3) சுந்தரா் தேவாரம் -	பொன்னார் மேனியனே – ஏழாம் திருமுறை –
	திருமழபாடி திருப்பதிகம் (1-10 பாடல்கள்)
4) மாணிக்கவாசகா் -	திருவாசகம் - அடைக்கலப்பத்து (1-10 பாடல்கள்)
கூறு 2 :	
1) நம்மாழ்வார் -	திருவாய்மொழி — முதல்திருமொழி ஒன்பதாம்பத்து
	கொண்ட பெண்டீர் 'எனத்தொடங்கும் பாசுரம் (1-10 பாடல்கள்)
2) திருமங்கையாழ்வார் -	பெரிய திருமொழி வாடினேன் வாடி பாசுரம் (1-10
	பாடல்கள்)
3) ஆண்டாள் -	நாச்சியா் திருமொழி
	'கருப்பூரம் நாறுமோ' பாசுரம் (1-10 பாடல்கள்)
4) திருவரங்கத்தமுதனார் -	இராமானுச நூற்றந்தாதி (1-10 பாடல்கள்)
கூறு 3 :	
1) திருமூலா் -	திருமந்திரம் - முதல் தந்திரம்
	வான்சிறப்பு முதல் நடுநிலைமை வரை (1-10 பாடல்கள்)
2) அருணகிரிநாதர் -	கந்தர் அலங்காரம் (1 முதல் 25 பாடல்கள்)
3) சிவப்பிரகாசர் -	நால்வர் நான்மணிமாலை
	(1-8 பாடல்கள்)
4) வள்ளலார் -	திருவருட்பா — ஆறாம் திருமுறை
	முறையீடு, (1-10 பாடல்கள்)

கூறு	4 :		
எச்.ஏ.	கிருட்டினப்பிள்ளை -	இரட்சஎ	ணிய மனோகரம்
		1.பால்ப	ப பிரார்த்தனை (1-20)
		அடியா	ர்களின் ஒழுக்கம் (1-10)
		் கிருநா	லட் பகிகம்(1-11)
		ച്ച് ച്ച്ച	пфф(1-10)
	-	0.07 07	næ@(1-10)
கூறு	5 :		
குணங்	குடி மஸ்தான் சாகிபு -	குணங்	குடி மஸ்தான் சாகிபு பாடல்கள்
		1. அக	த்தீசர் சதகம்(1-10) பாடல்கள்
		2.ஆன	ந்தக் களிப்பு
பார்ை	வ நூல்கள்		
1.	டாக்டர் ப. அருணாசலம்	:	பக்தி இலக்கியம் - ஓர் அறிமுகம், தமிழ்ப் புத்தகாலயம், பைகிராப்ட்ஸ் ரோடு, சென்னை – 5, 1973.
2.	முனைவர் சோ.ந. கந்தசாமி	:	திருமுறை இலக்கியம், உலகத் தமிழாராய்ச்சி நிறுவனம், சென்னை – 113,1995.
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7.	க. வெள்ளைவாரனார்	:	பன்னிரு திருமுறை வரலாறு இரண்டு தொகுதிகள், அண்ணாமலைப் பல்கலைக்கழகம் அண்ணாமலை நகர்.

தாள் 7

தொல்காப்பியம் - சொல்லதிகாரம்

கூறு	1	:	கிளவியாக்கம், வேற்றுமையியல்
கூறு	2	:	வேற்றுமை மயங்கியல், விளிமரபு
கூறு	3	:	பெயரியல், வினையியல்
கூறு	4	:	இடையியல், உரியியல்
கூறு	5	:	எச்சவியல்

பார்வை நூல்கள்:

1.	மு. சண்முகம்பிள்ளை (ப	.ஆ) :	தொல்காப்பியம் சொல்லதிகாரம்,
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2.	ஆ. சிவலிங்கனார்	:	தொல்காப்பியம் எழுத்ததிகாரம் (உரைவளங்கள்)
			உலகத் தமிழாராய்ச்சி நிறுவனம்,
			தரமணி, சென்னை – 600 113.
3.	கு. சுந்தரமூர்த்தி	:	தொல்காப்பியம் எழுத்ததிகாரம்,
			அண்ணாமலைப் பல்கலைக்கழகம்.
			அண்ணாமலை நகர்,
			1986.
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			அனைத்திந்திய மொழியியற் கழகம்.
			அண்ணாமலைநகர் - 608 201.
5.	மோ. இசுரயேல்		:பெயர்ச்சொல், வினைச்சொல், இடைச்சொல்,
			உரிச்சொல்,
			சர்வோதய இலக்கியப் பண்ணை.
			மதுரை – 625 001.
6.	ச. பாலசுந்தரனார்	:	தொல்காப்பியம் - சொல்லதிகாரம்
			ஆராய்ச்சிக் காண்டிகையுரை,
			பெ. மாதையன் (ப.ஆ),
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			கோட்பாடுகள்.
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					2009.
9.	தி.வே.	கோபாலையர்		:	தமிழ் இலக்கண உணர்வுகள்,
					தமிழ்மண் பதிப்பகம், தி.நகர்,
					சென்னை, 2005.
10.	ஆ. சி	லலிங்கனார்		:	தமிழ் இலக்கண உணர்வுகள்,
					கபிலன் பதிப்பகம்.
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					2005.
11.	ச. பாக	லசுந்தரம்		:	சொல்லிலக்கணக் கலைச்சொற் பொருள்விளக்க
					அகராதி,
					தாமரை வெளியீட்டகம்,
					367, மேலவீதி, தஞ்சாவூர் - 631 009,
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விருப்பப்பாடம் -**II**

1. சைவ சித்தாந்தம்

கூறு	1	:	சைவத்தின் தொன்மை வரலாறு — மொகஞ்சதாரோ ஹரப்பா
			தடயங்கள் -
			வேதத்தில் சைவம் - உபநிடத்தில் சைவம் - சங்க இலக்கியங்களில் சைவம் - காப்பியங்களில் சைவம்.
கூறு	2	:	சைவ சித்தாந்தக் கருத்துக்கள் - பன்னிரு திருமுறையில் சைவ
			சித்தாந்தக்கருத்துக்கள்.
கூறு	3	:	மெய்கண்ட சாத்திரங்கள் - சந்தானாசாரியர் - பதினான்கு சாத்திரங்கள்
			அறிமுகம் - உண்மை விளக்கம்.
கூறு	4	:	திருவருட்பயன் - பதிமுதுநிலை — உயிரவைநிலை - இருள்மல நிலை.
கூறு	5	:	சிவஞானபோதம் - 12 நூற்பாக்கள் மட்டும் (உதாரணச் செய்யுள்கள்,
			ஏது, அதிகரணம் நீங்கலாக)
unitada	ல நால்	т́т.	

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			கன்யா குருகுலம்,
			தோரண்யம், 1984.
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			நாகர்கோயில், 1979
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5.	விபி. காந்கிமகிநாக பிள்ளை :	சிவஞானபோகச் சொம்பொமிவ நால்.
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		மயிலாடுதுறை,
10		1978.
13.	க. வௌளைவாரனாா	பன்னரு தருமுறை வரலாறு (பாகம 1-2),
		அண்ணாமலைப் பலகலைக்கழகம்,
14		(1969, 1972).
14.	ലതലത്രമാലനുമാല :	சிவஞானலபாத சிற்றுரை, கைப் சிச்சாச்ச மாத தலைம்
		சைவ சித்தாந்த மகா சமாஜம், சென்னை
		ଭାଟ ଭାରଥାରା. 1040
15	ചന്ദ്രത്തവം പ്രാഹിലന്	பசார. முப்பொருள் பெல்ப
13.	அருவைவர்களை முற்றாயா :	முபலபாருள் ஆயல்பு. கைவ சிக்காக்கப் பெருமன்ற வெளியீம
		യായ ലാളാനാളാപയവന്നായാള് യാമണ്ഡന്യ, ചെക്കേഷ
		2004
		_

2. பெண்ணியப்படைப்புகள்

கூறு	1	:	பெண்ணியம் விளக்கம் - மேலை நாடுகளில் பெண்ணியம் -
			பெண்களுக்கு வாக்குரிமை – பெண் விடுதலை இயக்கம்.
கூறு	2	:	பெண்ணியக் கோட்பாடுகள் - பெண்ணடிமையின் காரணங்கள்,
			பெண்கள் முன்னேற வழிகள் - மிதவாதப் பெண்ணியம் - மாக்சியப் பெண்ணியம் - சோஷலிசப் பெண்ணியம் - தீவிரவாதப் பெண்ணியம் - ஆன்மீகப் பெண்ணியம் - கலாச்சாரப் பெண்ணியம் - கிறித்துவப் பெண்ணியம் - இந்தியப் பெண்ணியம் - பெரியார் பெண்ணியம்.
கூறு	3	:	பெண்ணியம் - இந்தியாவில் தோற்றமும் வளர்ச்சியும் - காலந்தோறும்
			பெண்மை — பெண்களும் சட்டங்களும் - பெண்களும் அரசுத் திட்டங்களும் - மகளிர் அமைப்புகள்.
கூறு	4	:	தமிழிலக்கிய நோக்கில் பெண்கள் - மரபு இலக்கியத்தில் பெண்கள் -
			பாரதி படைப்புகளில் பெண்ணியம் - பெண் சிறுகதை ஆசிரியர்கள் - பெண் நாவலாசிரியர் - பெண் புதுக்கவிஞர்கள் - மகளிர் இதழ்கள்
கூறு	5	:	இலக்கியமும் மகளிர் மேம்பாடும்- பெண்ணியப் படைப்புகளில்
			விமர்சனப் பார்வை — பின் நவீனத்துவப் பார்வையில் பெண்ணியம்.

பார்வை நூல்கள்

1.	முத்து சிதம்பரம்	:	பெண்ணியம் தோற்றமும் வளர்ச்சியும்,
			தமிழ்ப் புத்தகாலயம்,
			சென்னை,
			1997.
2.	பிரேமா	:	பெண் மரபியலும் இலக்கியமும்,
			தமிழ்ப் புத்தகாலயம்,
			சென்னை,
			2001.
3.	பிரேமா	:	பெண்ணியம்,
			தமிழ்ப் புத்தகாலயம்,
			சென்னை,
			2000.
4.	ராஜம் கிருஷ்ணன்	:	காலந்தோறும் பெண்,
			தாகம், சென்னை,
			2002.
5.	குமாரசாமி	:	பெண்ணிய நோக்கில் பாரதி.
			தமிழ்ப் புத்தகாலயம்,
			சென்னை.
			2001.
6.	சா. வளவன்	:	பெண் படைப்பாளர்தம் படைப்புகள்,
			ஏஜி 129/122, அண்ணாநகர்,
			சென்னை — 40, 1995.

7.	செ. கணேசலிங்கன்	:	பெண்ணியப் பார்வையில் திருக்குறள்,
			குமரன் பப்ளிஷா்ஸ்,
			சென்னை — 24.
8.	வீ. அரசு	:	பெண்ணியமும் பாரதியும்,
			அலைகள் வெளியீட்டகம்,
			சென்னை - 24
9.	சு. சிவகாம சுந்தரி	:	தமிழகப் பெண்கள் வாழ்வும் வளர்ச்சியும்,
			அன்பு வடிவு வெளியீட்டகம்,
			தஞ்சாவூர்.
10.	ஹரி. விஜயலட்சுமி	:	ராஜம்கிருஷ்ணன் புதினங்களில் பெண் மாந்தா்.
			என்னெஸ் பப்ளிகேஷன்ஸ்,
			உடுமலைப்பேட்டை.
11.	தாயம்மாள் அறவாணன்	:	பெண் இன்று நேற்று அன்று,
			பச்சைப்பசேல் பதிப்பகம்.
			புதுச்சேரி.
12.	சாரா காம்பிள்-டோரில்மோய்	:	பெண்ணியம் வரலாறும் கோட்பாடுகளும்,
			ராஜ்கௌதமன் (மொ.பெ), விடியல் பதிபப்கம்,
			கோவை, முதல் பதிப்பு 2011.

Open Elective paper -2

1. ஊடகத்தமிழ்

கூறு 1

ஊடகங்களின் அறிமுகம் - முக்கியத்துவம் - ஊடகங்களின் பரிணாம வளர்ச்சி - நிலைப்பாடு பண்பாடு தொடர்நிலையின் வகைகள் - பண்டைய அச்சு வழி சாதனஙகள் அஞ்சல் -தந்தி தொலைபேசி -கைபேசி - இணையம்

கூறு 2

இதழியல் அறிமுகம் இதழ்களின் சமுதாயப்பணி - கடமைகள் - பொறுப்புகள் - இந்திய இதழ்களின் தொடக்ககாலம் - தமிழ் இதழின் தோற்மும் வளர்ச்சியும் - தமிழ் பத்திரிக்கைகளின் வகைகள் - புகைப்படங்களும் இதழ்களும் -தற்கால இதழ்களின் எழுச்சியும் வீழ்ச்சியும்

கூறு 3

செய்திகளின் அவசியம் - செய்தியாளர்களின் தகுதி - விளக்கம் - வாயில்கள் - பொறுப்புகள் - பேட்டி முறைகள் - முகப்பு தலையங்கம் - மக்களாட்சியில் இதழ்களின் பங்கு - இவற்றின் வழி அறிவியல் வளர்ச்சி - பத்திரிக்கை சட்டங்களின் முக்கியத்துவம்

கூறு 4

அறிவியல் வளர்ச்சியில் வானொலியின் பங்கு - வளர்ச்சி - அவற்றின் பணிகள் -அவற்றின் நன்மை தீமைை தொலைக்காட்சியின் தோற்றம் வளர்ச்சி அவற்றின்வழி அறிவியல் வளர்ச்சி - திரைப்படத்தின் தோற்றம் வரலாறு கூறு 5

இணையம் இண்டர்நெட் வரலாறு - இணைத்தேடு பொறிகள் பயன்பாடுகள் உலகளாவிய வலை மின்னஞ்சல் அரசின் இணையதளம் சூப்பர் ஹைவே

பார்வை நூல்கள்

முனைவர் கி.இராசா	மக்கள் தகவல் தொடர்பியல் அறிமுகம்
	பாரதிதாசன் பல்கலைக்கழகம் திருச்சி
முனைவர் இரா மருதுநாயகம்	இருபத்தோராம் நூற்றாண்டில் மக்கள் தொடர்பியல், NCBH சென்னை
முக்தா சீனிவாசன்	தமிழ்த்திரைப்பட வரலாறு
	கங்கை புத்தக நிலையம்
அறந்தை நாராயணன்	தமிழ் சினிமாவின் கதை NCBH சென்னை
வெ.மு ஷாஜகான்	திரைப்படக்கலை,உயிர்மைப்பதிப்பகம் சென்னை 600017
மா.பா.குருசாமி	இதழியல் கலை
	மக்கள் ஊடகத்தொடர்பியல் புதியபரிமாணங்கள் - பிரியா பப்ளிகேஷன் மதுரை
மு.பொன்னவைக்கோ	இணையத்தமிழ்வரலாறு
	பாரதிதாசன் பல்கலைக்கழக வெளியீடு திருச்சி

2. நாடகத்தமிழ்

கூறு 1

தொல்காப்பியத்தின் வழி அறியலாகும் நாடகச் செய்திகள் - சங்க இலக்கிய நாடகக்கூறுகள் - சங்க இலக்கிய கூத்துகள் - சங்ககால இசையுணர்வு - சங்ககால இசைக்கருவிகள் -

கூறு -2

சிலம்பதிகாரத்தில் நாடகக்கூறுகள் - அரங்கேற்றுகாதை கதைச்சுருக்கம் - அடியார்க்குநல்லார் குறிப்பிடும் நாடகச்செய்திகள் - யாழ்பற்றிய செய்திகள்

கூறு 3

பல்லவர்கால நாடகங்கள் - பாண்டியர்கால நாடகங்கள் - சோழர்கால நாடகங்கள் - நாயக்கர் கால நாடகங்கள் - மராட்டியர் காலம் - மன்னர் காலத்தில் நாடகங்கள் பெற்ற சிறப்பு ஐரோப்பியர்கால நாடகங்கள்

கூறு 4

பள்ளு -குறவஞ்சி - நொண்டிநாடகம் - கீர்த்தனை நாடகங்கள் - ஓரங்க நாடகங்கள் -மொழிபெயர்ப்பு நாடகங்கள் - பாகவதமேளா - தெருக்கூத்து - மேடைநாடகம் - நாடக இலக்கியம் ஆகியவற்றின் தொடக்க நிலைச் செய்திகள் - மேடை நாடக இலக்கியங்கள் -செய்யுள் நாடக இலக்கியங்கள் - இலக்கியநாடக ஏடுகள் கூறு 5 நாடக ஆசிரியர்கள் - நாடகக்குழுக்களை நடத்தியவர்கள் - குழுக்கள் - வானொலி நாடகங்கள் - தொலைக்காட்சி நாடக வகைகள் - தற்கால நாடகங்கள் பார்வை நூல்கள் 1. ஆபிரகாம் பண்டிதர் மு இசைத்தமிழ் நூல், அன்றில் பதிப்பகம் சென்னை. 2. ஆளவந்தார் ஆர் தமிழர் தோற்கருவிகள், உலகத்தமிழ் ஆராய்ச்சி நிறுவனம், சென்னை. 3. இரவீந்திரன் க தி.க.சண்முகம் நாடகங்கள், அதங்கோடு குமரி மாவட்டம் (1987)4. இராசமாணிக்கனார் மா தமிழகக்கலைகள், பாரிநிலையம் சென்னை. 5. இராமசாமி மு தமிழ் நாடகம் நேற்று இன்று நாளை, ருத்ரா பதிப்பகம், தஞ்சாவூர். 6. இராமசாமி மு & முருகேசன் கு இருபதாம் நூற்றாண்டுத்தமிழ் நாடகங்கள், உலகத்தமிழ் ஆராய்ச்சி நிறுவனம், சென்னை. 7. முத்துசண்முகம் & முனைவர் பெரியகருப்பன் நாடகக்கலையின் வரலாறு மதுரைப்பல்கலைக்கழகம் 1975 8. விபுலானந்த அடிகள் யாழ்நூல், கரந்தை தமிழ்ச்சங்கம், ஐந்திணைப்பதிப்பகம் 9. மது.ச. விமலானந்தம் தமிழ் இலக்கியவரலாற்றுக்களஞ்சியம் ஐந்திணைப்பதிப்பகம், சென்னை. 10. பகவதி முனைவர் கு தமிழ் மேடை நாடக வரலாறு, உலகத்தமிழ் ஆராய்ச்சி நிறுவனம் சென்னை 11. நாடகக் களஞ்சியம் தமிழ்ப்பல்கலைக்கழ வெளியீடு தொகுதி -1 தஞ்சாவூர்

ANNAMALAI UNIVERSITY Syllabi for the Affiliated Colleges BACHELOR OF ARTS

B.A. ENGLISH

DEGREE COURSE

CBCS PATTERN

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The Course of Study and the Scheme of Examinations

S.NO.	Part	Study Components		Ins. hrs /week	Credit	Title of the Paper	Maximum Marks		
		Course Title					CIA	Uni. Exam	Total
SEMESTER I									
1	Ι	Language	Paper-1	6	4	Tamil/Other Languages	25	75	100
2	П	English (CE)	Paper-1	6	4	Communicative English I	25	75	100
3	III	Core Theory	Paper-1	5	3	Indian writing in English	25	75	100
4	=	Core Theory	Paper-2	5	3	Advanced English Grammar	25	75	100
5	III	ALLIED -1	Paper-1	6	3	Literary forms and glossary of terms	25	75	100
6	III	PE	Paper-1	6	3	Professional English I	25	75	100
7	IV	Environmental Studies		2	2	Environmental Studies	25	75	100
				36	22		175	525	700
SEMESTER II							CIA	Uni. Exam	Total
8	Ι	Language	Paper-2	6	4	Tamil/Other Languages	25	75	100
9	П	English (CE)	Paper-2	4	4	Communicative English I	25	75	100
10	Ш	Core Theory	Paper-3	5	3	British Literature I	25	75	100
11	Ш	Core Theory	Paper-4	5	3	American literature (classical and modern literature)	25	75	100
12		ALLIED-1	Paper-2	6	5	Social History of England	25	75	100
13		PE	Paper-2	6	3	Professional English II	25	75	100
14	IV	Value Education		2	2	Value Education	25	75	100
15	IV	Soft Skill		2	1	Soft Skill	25	75	100
				36	25		200	600	800

ANNAMALAI UNIVERSITY B.A. ENGLISH

SYLLABUS UNDER CBCS (2021-2022)

SEMESTER I

PAPER - 1

INDIAN WRITING IN ENGLISH

OBJECTIVES:

To understand the various features of Indian Literature in English. To get a glimpse of the regional literatures in English. To make the students be aware of the superstitious practices in Indian culture. To inculcate the spiritual and moral values from the Indian Sages. To analyze the aspects of Indianness in Indian writing in English.

SYLLABUS

Unit -1 :Poetry

A very Indian poem in Indian English- Nissim Ezekiel
Coromandel Fishers - Sarojini Naidu
Home Coming-R.Parthasarathy.

Unit-2:Poetry

1.Of Mothers, among other things-A.K.Ramanujam2.An Old Woman – ArunKolatkar3.Immigrant Song- Tishani Dhoshi

Unit-3:Prose

The Child's Return- Rabindranath Tagore
The Portrait of a Lady-Kushwant Singh
Vivekananda's World Mission-Bhabani Bhattacharya

Unit-4: Drama

1.Nagamandala-Girish Karnad

UNIT-5: NOVEL 1.The White Tiger – Aravind Adiga

COURSE OUT COME

UNIT I

Students will be able to examine the concepts of Indian English Poetry. Students will be able to comment on the humor in A Very Indian Poem in English. Students will be able to understand the life of fishermen community Students will be able to grasp the in-depth ideas about the poem Home Coming. Students will be able to know about Autobiographical Poem.

UNIT II

Students will be able to appreciate the poem Of Mother, among other Things. Students will be able to identify different images of the Mother. The students will be able to understand the sense of loss of identity in immigrants Students will be able to analyze the reality of a beggar Old Woman. Students will be able to understand the style of Indian Poetry.

UNIT III

Students will be able to scrutinize the writing style adopted by Kushwant Singh. Students will be able to understand Tagore as a short story writer. Students will be able to identify the writing style of BhabiniBhatachariya . Students will be able to inculcate the moral ideas of Swami Vivekananda. Students will be able to evaluateBhabiniBhatachariya as an essayist.

UNIT IV

Students will be able to analyze the plot Nagamandala. Students will be able to know about the writing style of GirishKarnad. Students will be able to understand the superstitious beliefs in Indian culture . Students will be able to know about the significance of marital relationship . Students will become familiar with popular myth.

UNIT V

Students will be able to understand the concept of globalization. Students will be able to absorb the importance of family. Students will be made aware of corruption in India

WEB SOURCES:

https://khanindradutta.wordpress.com/2019/02/27/nissim-ezekiels-poem-very-indian-poem-in-indian-english-complete-poem/

https://www.poetrynook.com/poem/homecoming-0

http://e4english-corner-sasha.blogspot.com/2013/11/an-old-woman-by-arun-kolatkar-poem-

and.html#:~:text=In%20Arun%20Kolatkar's%20poem%2C%20%22An,land%20from%20whic h%20she%20comes.&text=The%20old%20woman%20'tightens%20her,She%20is%20persist ent.

http://www.ncert.nic.in/ncerts/l/kehb101.pdf https://archive.org/details/in.ernet.dli.2015.463117/page/n13/mode/2up https://archive.org/details/whitetigernovel00adig/page/n9?q=the+white+tiger+arvind+adig a

REFERENCE TEXT BOOKS

Karnad, Girish Raghunath. Nagamandala. Oxford University Press, 1990.

CORE THEORY PAPER – 2

ADVANCED ENGLISH GRAMMAR

OBJECTIVES

Students will be able to understand the basics of Grammar. To understand how to use Grammar correctly. To learn to be confident in using advanced Grammar. To write English without grammatical errors. To gain confidence in learning English.

UNIT 1

Parts of speech –Noun –Pronoun-Adjective-Verb-Adverb-Conjunction-Preposition-Interjection-Definition-Types-Examples

UNIT 2

Types Of Sentences-Statement-Interrogative-Exclamatory-Imperative

UNIT 3

Sentence Pattern-Types-SV-SVO-SVC-SVA-SVOO-SVOC-SVOA

UNIT 4

Tenses- Subject -Verb-Concord

UNIT5

Phrases And Clauses-Definition And Types

REFERENCE TEXTBOOKS

- 1. DR. M R Kumaraswamy, C.Chidambaram, P.Karthi. <u>Grammar and Composition.</u> Madurai: Print, 2019.
- 2. Hewings, Martin. <u>Advanced English Grammar.</u> New Delhi: Cambridge University Press, 1999.

COURSE OUTCOMES

UNIT I

Students will be able to get distinct ideas on all the parts of speech. Students will be able to understand Parts of Speech and their types. Students will be able to use Parts of Speech with relevant Examples. Students will be able to examine the usage of Parts of Speech in various contexts. Students will be able to identify the different ways to adopt Parts of Speech.

UNIT II

Students will be able to know about the Types of sentences. Students will be able to understand Statement sentence with illustrations. Students will be able to know Interrogative sentence with illustrations. Students will be able to identify Imperative sentence with illustrations. Students will be able to understand Exclamatory sentence with illustrations.

UNIT III

Students will be able to know about Sentence Pattern and its types. Students will be able to recognize the different types of Sentence Pattern. Students will be able to identify the different ways to adopt Sentence Pattern. Students will be able to examine the correct usage of Sentence Pattern. Students will be able to distinguish the Sentence Pattern with the help of illustrations.

UNIT IV

Students will be able to know about Tense and its kinds. Students will be able to understand and use Tenses in day to day life. Students will be able to know about Subject and its Usage. Students will be able to be familiar with Concord. Students will be made aware of Verb and its Kind.

UNIT V

Students will be able to understand Phrases. Students will be able to absorb noun, verb, adjectival and prepositional phrases. Students will be made aware of Definitions of Clauses and its types. Students will be able to comprehend Clauses with illustrations. Students will be able to distinguish Clauses with the help of illustrations.

ALLIED – 1 PAPER – 1

LITERARY FORMS AND TERMS

OBJECTIVES

To expose the learners to the most common elements of literature.

To examine different genres of literature.

To scrutinize the various Literary Forms

To understand the characteristics of Poetry, Prose, Drama and Novel.

To Understand different literary terms.

UNIT I: POETRY

- 1. What is Poetry?
- 2. The Lyric
- 3. The Sonnet
- 4. The Elegy
- 5. The Epic
- 6. The Ode

UNIT II : PROSE

- 1. The Essay
- 2. The Short Story
- 3. Biography
- 4. Autobiography

UNIT III: DRAMA

- 1. The Tragedy
- 2. The Comedy
- 3. Tragi-Comedy
- 4. The One-act play
- 5. The Absurd Drama

UNIT IV: NOVEL

- 1. Historical Novel
- 2. The Picaresque Novel
- 3. The Stream of consciousness Novel

UNIT V: LITERARY TERMS

Allegory, Comic Relief, Dramatic Monologue, Farce, Euphemism, Expressionism, Satire, Plot, Melo Drama, Irony, Soliloquy.
BOOKS FOR STUDY AND REFERENCE:

- 1. Prescribed text A Glossary of Literary Terms. M.H. Abrams Macmillan Publishers India Ltd. (Trinity -Laxmi Publications, Chennai)
- 2. Nair, K R Ramachandran. Literary Forms. Chennai: Emerald, 1995. print.

COURSE OUTCOMES

UNIT I

Students will be able to understand how poetry requires a different writing style. Students will be able to get,in-depth ideas of Poetry. Students will be able to understand the traits of Lyric, Ode, and Sonnet. Students will be able to examine Elegy and Epic. Students will be able to scrutinize different kinds of Poetry.

UNIT II

Students will be able to understand prose aswriting with distinct style. Students will be able to know the characteristics of Short Story. Students will be able to understand the ideas behind Essay. Students will be able to understand the basic traits of Biography. Students will be able to know about Autobiography in detail.

UNIT III

Students will be able to understand Drama as a genre with distinct style. Students will be able to distinguish Tragedy and Comedy as a separate genre. Students will be able to understand Tragi - Comedy. Students will be able to examine characteristics of One Act Play. Students will be able to absorb the principles of the Absurd Drama .

UNIT IV

Students will be able to understand novel'scharacteristics. Students will be able to know about Historical Novel. Students will be able to be familiar with Picaresque Novel. Students will be made aware of The Stream of Consciousness Novel. Students will be able to absorb the characteristics of various types of Novels

UNIT V

Students will be able to understand few important Literary Terms. Students will be able to absorb the basic ideas of Plot, Melodrama and Irony. Students will be made aware of Euphemism, Expressionism and Satire. Students will be able to comprehend Allegory, Comic Relief and Dramatic Monologue. Students will be able to identify the usages of Literary Terms.

SEMESTER II

CORE THEORY PAPER – 3

BRITISH LITERATURE I

OBJECTIVES

- 1. To expose the students to the beginning of modern literature
- 2. To introduce students to metaphysical and neoclassical poetry
- 3. To know the style of Bacon's essays
- 4. To expose the students to the social life of 17th century people
- 5. To learn the form ,allegorical novel .

UNIT 1:Poetry

The hymn to God, the Father-John donne Song for St.Cecilia's Day-John Dryden The Collar – George Herbert

UNIT 2:Poetry

How soon hath time-John Milton Ode to Solitude-Alexander Pope On My First Sonnet – Ben Jonson

UNIT 3:Prose

Of Friendship Of Studies Of Books -FrancisBacon

UNIT 4:Drama

The Shoemaker's holiday -Thomas Dekker

UNIT 5:Novel

The Pilgrim's Progress - John Bunyan

COURSE OUT COME

UNIT I

The students will be able to

- 1. Identify the characteristic features of metaphysical poetry
- 2. Critically appreciate the poem, "Hymn to God, the Father"
- 3. Analyse the theme of "Song for St. Cecilia's Day"
- 4. Identify the neoclassical elements found in the prescribed poems
- 5. Understand Dryden as a neoclassical poet

UNIT II

The students will be able to

- 1. Understand Milton's greatness as a poet
- 2. Understand how one has to wait for the right time to accomplish great works
- 3. Appreciate the grand style of Milton
- 4. Understand Pope as the representative poet of neoclassicism
- 5. Appreciate the value of simple life

UNIT III

The students will be able to

- 1. Understand the three fruits of friendship
- 2. Know the purpose of studying
- 3. Understand the advantages of studying
- 4. Understand the greatness of books
- 5. Appreciate the style of Bacon

UNIT IV

The students will be able to

- 1. Understand the social life of 17th century England
- 2. Critically appreciate the play, The Shoemaker's Holiday"
- 3. Analyse the characters of the Play
- 4. Know how war leads to disability of persons
- 5. Understand the class system of English People

UNIT V

The students will be able to

- 1. Understand Pilgrims Progress as an Allegory
- 2. Appreciate the theme of salvation.
- 3. Understand that the road to Heaven is not easy, the cost is great,
- 4. Know that the true Christian must be willing to pay the cost no matter what.
- 5. Know that man is full of sin, but this does not keep him from attaining glory.

WEB SOURCES:

- 1. https://www.poetryfoundation.org/poems/44115/a-hymn-to-god-the-father
- 2. https://www.poetryfoundation.org/poems/44185/a-song-for-st-cecilias-day-1687
- 3. https://www.poetryfoundation.org/poems/44360/the-collar

- 4. <u>https://www.poetryfoundation.org/poems/44744/sonnet-7-how-soon-hath-time-the-subtle-thief-of-youth</u>
- 5. https://www.poetryfoundation.org/poems/46561/ode-on-solitude
- 6. https://www.poetryfoundation.org/poems/44455/on-my-first-son
- 7. <u>https://www.fulltextarchive.com/page/Essays2/</u>
- 8. <u>https://www.fulltextarchive.com/page/Essays3/</u>
- 9. https://emed.folger.edu/sites/default/files/EMEDWorkshop-ShoeHol.pdf
- 10. http://bunyanministries.org/books/pp_full_text.pdf

CORE THEORY PAPER – 4

AMERICAN LITERATURE

OBJECTIVES

- 1. To introduce the major works of American authors and their intellectual philosophies to students of Literature.
- 2. To portrait different periods and movements of American Literature
- 3. To make our students familiar with American thoughts and lifestyle .
- 4. 4.To direct students' ardent attention towards the development of their knowledge about American Literature
- 5. To project their fancy for lyrical gaiety of top American poets
- 6. To channelize their academic vision to grasp more about the American Drama and Fiction

UNIT-1: Poetry

- 1. Robert Lowell Children of Light, The Holy Innocents
- 2. Carl Sandburg Chicago
- 3. William Stanley Merwin Green Fields, Another River
- 4. Robert Frost Stopping by Woods on a Snowy Evening

UNIT-2: Poetry

- 1. Walt Whitman Passage to India
- 2. Emily Dickinson I Felt a Funeral in My Brain
- 3. Edgar Allan Poe Sonnet Silence
- 4. Wallace Stevens Anecdote of the Jar

UNIT-3: Prose

- 1. Henry David Thoreau The Battle of the Ants
- 2. Martin Luther King I have a Dream
- 3. Ralph Waldo Emerson Self-Reliance

UNIT-4: Drama

1. Arthur Miller – Death of a Salesman

UNIT-5: Fiction

1. Ernest Hemingway - The Old Man and the Sea

TEXT BOOKS

UNIT-1:

- 1. American Poetry of the Twentieth Century, Edited by Richard Gray, Cambridge University Press
- 2. A textbook of American Literature, Edited by Board of Editors, Sarah Publishers

UNIT-2:

1. An Anthology of Poems, Edited by C. Subbaian, Emerald Publishers

UNIT-3:

- 1. American Literature, An Anthology of Prose, Edited by Dr. P. Marudanayagam, Emerald Publishers
- 2. American Literature, Edited by Prof. G. Venkatesalu, Manimekala Publishing House

UNIT-4

- 1. Death of a Salesman : Arthur Miller , Penguin UK Edition
- 2. A Student Handbook to The Plays of Arthur Miller ,Bloomsbury Publishing India Ltd.

UNIT-5:

- 1. The Old Man and the Sea, Ernest Hemingway, Maple Press Classics Publishers Complete and Unabridged
- 2. Ernest Hemingway's The Old Man and the Sea , P.G. Rama Rao The New Atlantic Critical Studies

REFERENCE ITEMS: BOOKS, JOURNAL

- 1. A Text Book of The Old Man and the Sea , Dr. V. Alexander, Mahaam Publishers
- 2. American Literature, Edited by Prof. G. Venkatesalu, Manimekala Publishing House
- 3. A Short History of American Literature, Krishna Sen and AshokeSengupta, Orient Black Swan Publisher
- 4. American Literature, NandanaDutta, Edited by Pramod K Nayar, Orient Black Swan Publisher
- 5. Studies in American Literature, Malikaarjun Patil, Atlantic Publishers
- 6. Modern American Literature, Edited by RajeshwarMittapalli and Claudio Gorlier, Atlantic Publishers
- 7. Walt Whitman Selected Poems : A Critical Evaluation, Dr. S. Sen, Unique Publishers
- 8. A History of American Literature, Sathish Kumar, LakshmiNarainAgarwal Publishers
- 9. The Oxford Companion to American Literature, James D. Hart, 6th Edition, Oxford University Press
- 10. A Short History of American Literature, Edited by William Peterfield Trent, Cambridge University Press

E-MATERIALS

- 1. https://www.theatlantic.com/w.s.merwin
- 2. <u>https://www.poetryfoundation.org/w.s.merwin</u>
- 3. <u>https://www.poem hunter.com/w.s.merwin</u>
- 4. <u>https://www.poeticside.com/poets/w.s.merwin</u>
- 5. https://www.cliffnotes.com/americanwriters

- 6. <u>https://www.poeticside.com/poets/w.s.merwin</u>
- 7. <u>https://www.poemanalysis.com/americanpoets</u>
- 8. https://www.whitmanarchive.org
- 9. <u>https://www.enotes.com/americanwriterspoets</u>
- 10. https://www.bl.uk.collections
- 11. https://www.beamingnotes.com/americandramatists
- 12. https://www.britannia.com/americanliterature
- 13. https://www.sparknotes.com/americanpoets
- 14. https://www.imagination.com/americanliterature
- 15. https://www.gradesaver.com/americanwriters

COURSE OUTCOME

UNIT-1

- 1. the student will be able to grasp the lyrical richness embedded in American Poetry
- 2. the student will be able to understand the modern American writer like Merwin and his thoughts related to Environment
- 3. the student will come to know the great American Poets like Frost, Lowell and Sandburg and their works.
- 4. the student will be able to develop a taste of American poetry and thus he or she further reads and understands
- 5. the student will search in web, related poems written by these great poets to develop further knowledge on poetry

UNIT-2

- 1. the student will be able to admire and try to emulate the literary expertise of Walt Whitman, Emily Dickinson, Edgar Allan Poe and Wallace Stevens
- 2. the student will come to know the literary terms available in the American poetry
- 3. the student will get inspiration from Walt Whitman and his knowledge about India
- 4. the student will read further about these great poets
- 5. the student will develop a taste to study the lifestyle of American people

UNIT-3

- 1. the student will be able to judge the supremacy of American output
- 2. the student will come to know the great prose writers of American Literature Emerson, Thoreau and Martin Luther King
- 3. the student will understand the real thoughts of the American writers
- 4. the student will get inspiration through these works and it will kindle him or her to read more
- 5. the student will understand the philosophy of these writers.

UNIT-4

- 1. the student will be able to judge the supremacy of American drama
- 2. the student will come to know the great dramatist of American Literature Arthur Miller

- 3. the student will understand the real thoughts of the American dramatists in general
- 4. the student will get inspiration through this drama and it will kindle him or her to read more dramas of American Literature
- 5. the student will understand the usage of language in the drama

UNIT-5

- 1. the student will be able to judge the supremacy of American fiction
- 2. the student will come to know the great fiction writers of American Literature Ernest Hemingway
- 3. the student will understand the real thoughts of the American fictions and Sea life
- 4. the student will get inspiration through this fiction and it will kindle him or her to read more fictions of American Literature
- 5. the student will understand the real concept of lifestyle of Americans.

ALLIED –1 PAPER – 2

THE SOCIAL HISTORY OF ENGLAND

OBJECTIVE

To provide a profound background to the UG programme: B A English Literature. Literature being a mirror of life with an extensive knowledge of English social life, English literature could be appreciated, relished and enjoyed. So, with this view this paper is designed and it focuses on the major trends which have moulded the English society.

UNIT I

A brief history of the early inhabitants of England, The Hundred Years of War (1337-1453) The war of the Roses. The Black Death & The Peasants Revolt.

Emergence of a Strong Monarchy –The Church – The Monasteries - The grammar schools, public schools, Education - The status of Women – Love and Marriage - The Printing Press – Its Significance

UNIT II

Social Life of During:

The Renaissance, The Reformation, The Spanish Armada - The Elizabethan - Theatre and Audience – The Rule of Queen Elizabeth I – A Golden Period – The East India Company - The Puritan Age & Restoration England

UNIT III

Colonization, The Stuarts – King James Authorized Version of the Bible – The Civil War, The Puritan Rule, The Restoration England - The Royal Society – The Glorious Revolution

UNIT IV

Queen Anne's England – The War of American Independence – Religious Movements – Humanitarian Movements – The French Revolution – Social Condition of England in the 18th Century

UNIT V

The Victorian Age – Reform Bills – The Chartist Movement - The Modern Age – The Cold War – Life in Sixties, Seventies, Eighties – The Origin and Growth of Political Parties in England.

OUT COME:

This Comprehensive Paper enables the students to understand the subject thoroughly and provides them the scope of their study. Helps them in the long run should go for their higher studies and appear for competitive examinations such as (NET, SET, TET Etc)

TEXT BOOKS

- 1. The Social History of England, Dr. A. Shanmugakani., Ph.D. Manimekala Publishing House
- 2. An Introduction to The Social History of England by A.G Xavier Viswanathan, S., Printers & Publisher Pvt Ltd.

REFERENCE:

- 1. Trevelyan, G.M English Social History, Longmans, London, 1958,
- 2. Subramaniam, M.V Social History of England, Wardha Publishing House, Madras 1972.

ANNAMALAI UNIVERSITY

M.A. ENGLISH

SYLLABUS

UNDER CBCS

(2021-2022)

PROGRAMME OBJECTIVES

The Programme aims to develop the ability of the student to critically examine and restate his/her understanding of literary texts, employing individual linguistic skills, engendering literary concepts and critical approaches to arrive at the core and essence of narratives. The learning process would also lead to a larger comprehension of global, national, social issues and thereby facilitate the students to address the issues proactivity and gain a reasonable command of the language.

PROGRAMME OUTCOME

- On completion of the programme the student will be able to:
- Interpret his/her understanding of form, structure, narrative technique, devices and style.
- Analyze and apply various literary concepts and critical approaches.
- Appreciate the importance of English as an international language, to benefit from the achievements of other cultures in accordance with various life situations.
- Organize and integrate the acquired knowledge towards individualistic compositions.
- Present, appraise and defend arguments with conviction and confidence.

M.A. ENGLISH EMPLOYMENT AREAS

- 1. Advertising Industry
- 2. Corporate Communication
- 3. Communications Industry
- 4. Indian Civil Services
- 5. Journalism
- 6. Online Tutoring
- 7. Politics
- 8. Publication Houses
- 9. Public Relations
- 10. Research

- 11. TV & Media
- 12. Translation Agencies

M.A ENGLISH JOB TYPES

- 1. IELTS trainer
- 2. English Translator
- 3. Junior Parliamentary Reporter (English)
- 4. English Editor
- 5. Translator/Interpreter
- 6. English Teacher
- 7. Content Writer/Trainer
- 8. English Tutor
- 9. Customer Support Executive
- 10. English Proof Reader
- 11. English Language Specialist
- 12. Media Analyst
- 13. Stenographer (English)

THIRUVALLUVAR UNIVERSITY MASTER OF SCIENCE M.A. ENGLISH

(2021-2022)

Sl.	Study Compo	nents	ins.	Cred	Tide of the Demon	Ma.	ximum M	larks
No.	Course Title		rse Title it Ittle of the Paper		CIA	Uni.	Total	
SEMESTER I					•m	Exam	100000	
1		Paper- 1	6	4	British Poetry (Chaucer to 20th century)	25	75	100
2	Core	Paper- 2	6	4	American Literature	25	75	100
3		Paper- 3	6	4	Indian Literature in English	25	75	100
4		Paper- 4	6	4	Advanced Linguistics	25	75	100
Internal Elective for same major students								
5	Core Elective	Paper-1	3	3	(To choose one out of 3)A. Indian Writing in TranslationB. Fourth World LiteratureC. Folk Tale and Myth	25	75	100
	I	External Elec	tive for c	other ma	ajor students (Inter/multi disciplinary pape	rs)		
6	Open Elective	Paper-1	3	3	(To choose one out of 3)A. Literature for Social TransformationB. Green Cultural StudiesC. Public Speaking and Creative Writing	25	75	100
			30	22		150	450	600

The Course of Study and the Scheme of Examination

SEM	SEMESTER II					CIA	Uni. Exam	Total
7	0	Paper- 5	6	4	British Drama	25	75	100
8	Core	Paper- 6	6	4	Translation Theory & Practice	25	75	100
9		Paper- 7	6	4	Contemporary Literary Theory - I	25	75	100
			Inter	nal Elec	tive for same major students			
10	Core Elective	Paper-2	5	3	 (To choose one out of 3) A. Comparative Literature B. New Literature in English. C. Subaltern Literary Studies 	25	75	100
	External Elective for other major students (Inter/multi disciplinary papers)							
11	Open Elective	Paper-2	5	3	 (To choose one out of 3) A. Technical Writing. B. Indian Diaspora Literature C. Journalism and Mass Communication. 	25	75	100
12	*Field Study		-	2		100	-	100
13	Compulsory Paper		2	2	Human Rights	25	75	100
			30	22		250	450	700

*** FIELD STUDY**

There will be field study which is compulsory in the first semester of all PG courses with 2 credits. This field study should be related to the subject concerned with social impact. Field and Topic should be registered by the students in the first semester of their study along with the name of a mentor before the end of the month of August. The report with problem identification and proposed solution should be written in not less than 25 pages in a standard format and it should be submitted at the end of second semester. The period for undergoing the field study is **30 hours beyond the instructional hours** of the respective programme. Students shall consult their mentors within campus and experts outside the campus for selecting the field and topic of the field study. The following members may be nominated for confirming the topic and evaluation the field study report.

- (i). Head of the respective department
- (ii). Mentor
- (iii). One faculty from other department

THIRUVALLUVAR UNIVERSITY

M.A. ENGLISH

SYLLABUS

UNDER CBCS

(2020-2021)

SEMESTER-I

PAPER - 1

BRITISH POETRY (CHAUCER TO 20th CENTURY)

OBJECTIVES:

- To sensitize them to feel the pulse of poetic expression by making them understand and appreciate beat, rhythm, rhyme, etc.
- To enable them understand the concepts related to Elizabethan l, Metaphysical, Romantic, Victorian, Modern & Postmodern poetry, to name a few
- To make them appreciate poetry by critically analyzing the poems in terms of theme, content, background, etc.

UNIT PLAN:

- After studying student will be able to understand the background history of literature and language
- The student will be able to know how to appreciate and analyses the poetry
- ✤ The student will be able to know the beauty of the literary terms and forms

COURSE OUTCOME

- > The student will learn about the metaphysical poets and their style of writings.
- > The student will know about the love and lust towards opposite gender
- > The student will be able to differentiate the various types of sonnets
- > The student will enjoy the beauty of the nature and imagination
- > The student will understand the romantic life of the poets
- > The student will differentiate the changes of language and style

UNIT I: INTRODUCTION

- 1. a). What is poetry?
 - b) Metrical & free verse-kinds of poetry.
 - c) Poetic justice, Poetic License, Poetic diction, Poetic devices, Figures of speech, etc.
 - d) Themes Of poetry e) Appreciation of poetry.

UNIT II: POETRY (DETAILED)

	Geoffrey Chaucer	:	The love Unfeigned
	William Shakespeare	:	Sonnet 147
	John Milton	:	Light
	John Donne	:	Canonization
	Andrew Marvel	:	To His Coy Mistress
	(Non-Detailed)		
1.	Edmund Spenser	:	Epithalamion
2.	George Herbert	:	The Pulley

UNIT III: (DETAILED)

2.

	William Wordsworth	:	Tintern Abbey
	P. B Shelly	:	Ode to Skylark
	John Keats	:	Ode on a Grecian Urn
	Christina Rossetti	:	Christmas Eve
	(Non-Detailed)		
1.	ST Coleridge	:	The Rime of an Ancient Mariner
2.	Robert Browning	:	Andrea Del Sarto
UNIT	IV: (Detailed)		
	T.S Eliot	:	Ash Wednesday
	W. B. Yeats	:	Sailing to Byzantium
	Philip Larkin	:	Toads
	Alexander Pope	:	On a Certain Lady at Court
	Carol Ann Duffy	:	1) Valentine
			2) Prayer
	(Non-Detailed)		
1.	Elizabeth Jennings :	The C	Old Woman

Norman McCraig : Stars and Planets

UNIT V: (NON-Detailed)

1.	Thomas Gunn	:	You got to go
2.	Seamus Haney	:	Blackberry Picking
3.	RS Thomas	:	Peasant
4.	Charles Tomlinson	:	A rose for Janet

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- 1. Arthur Quilter Couch, Ed., *The Oxford Book of English Verse* (1250-1900). Oxford: OUP,1923.
- 2. Bird, Ed., Books of Ballads. London:Longmans, 1967.
- 3. Grierson & Smith, Critical History of English Poetry. London : OUP, 1970
- 4. Wilson, Shakespeare's Sugared Sonnets. London: CUP, 1974.
- Heath Stubbs & Wright, Faber Book of Twentieth Century verse. London: Faber & Faber, 1975
- Palgrave, Ed., Golden Treasury of the best songs and lyrical poems in the. English language. London: OUP, 1977.
- 7. Roberts, Ed., *Faber Book of Modern verse*. London: Faber & Faber, 1979.
- 8. Roberts, Ed., Faber Book of Modern Verse. London: Faber & Faber, 2000

PAPER - 2 AMERICAN LITERATURE

OBJECTIVES:

- To enable the students to have an overview of major authors who have given significant contributions to the development of American literature.
- The social and political events that have influenced the literary movements can be understood by the study of representative authors.

UNIT PLAN

1.

2.

- ✤ The student will able to understand the themes of the poem
- ✤ The student will know the concept of modernism and post modernism
- ✤ The student will understand the aesthetic sense of poetry
- ✤ The student will know the culture and history of the United States

COURSE OUTCOME

- > The student will come to know the prominent women writers
- > The student will able to distinguish the various thinking of American society
- > The student will understand transcendentalists and naturalists
- > The student will receive the seclusion temper and patriarchal society
- > The student will learn the reality of working classes and middle classes living in cities

UNIT I: POETRY (DETAILED)

Walt Whitman			:	When the Lilacs Last Bloom'd
Robert Frost			:	After Apple Picking
Allen Ginsberg			:	Howl
Emily Dickinson			:	1. Knows how to forget!
				2. Success is Counted Sweetest
Wallace Stevens			:	The Idea of Order at Key West
Langston Hughes			:	The Negro speaks of River out of work
(Non-detailed)				
Anne Bradstreet	:		Conte	mplations
Edward Taylor		:	1) The	e soul's Groan to Christ for succor
	:		2) Chi	rist's Reply.

UNIT II: PROSE (DETAILED)

Ralph Waldo Emerson	:	1) Self-Reliance
	:	2) The American Scholar
(Non-detailed)		
Maya Angelou	:	I know why the Caged bird sings
	Ralph Waldo Emerson (Non-detailed) Maya Angelou	Ralph Waldo Emerson:::(Non-detailed):Maya Angelou:

UNIT III: DRAMA (DETAILED)

Tennessee Williams	:	A Streetcar Named Desire
(Non- Detail)		
Edward Albee	:	A Cat on a Hot Tin Roof
Tony Kushner	:	Angels in America (Part-1)

UNIT IV: SHORT STORIES (NON-DETAILED)

1.	Nathaniel Hawthorne	:	The Purloined Letter
2.	John Updike	:	The Witness
3.	Pearl S. Buck	:	The Quarrel
4.	John Steinbeck	:	Flight
5.	Eudore Welty	:	Worn Path

UNIT V FICTION (NON-DETAILED)

1.	Eudora Welty	:	The Optimist's Daughter
2.	John Barth	:	Lost in the Funhouse
3.	Toni Morrison	:	Beloved

REFERENCE

- Bugsbu, C.W.E. A *Critical Introduction to Twentieth Century American* Drama.CUP, 1984.
- Allen, Paul Gunn. "*Studies in American Indian Literature*". New York: Modern Language Association. 1983.
- Andrews, W., F. Foster, and T. Harris (eds.). "*The Oxford Companion to African American Literature*. Oxford, 1997.
- Kim, H. Elaine. *Asian American Literature: An Introduction to the Writings and Their Social Context.* Pearson Longman, 2004.
- Kranser, David (ed). *A Companion to Twentieth Century American Drama*, Blackwell Publishing, USA, 2005.

PAPER - 3 INDIAN LITERATURE IN ENGLISH

OBJECTIVES:

- To help the students appreciate the richness in Indian writing in English.
- To acquaint the students with the eminent Indian writers in English.

UNIT PLAN

- * The student will able to know the complete picture of Indian writers and their uniqueness
- The student will come to know the traditional and cultural background
- * The student will acquire the idea about the customs and superstitious belief of Indians
- * The student will realize the importance of spirituality in Indian writing

COURSE OUTCOME

- > The student will be able to know the importance of translation in various works
- > The student will know the sufferings and submissive conditions of people
- The student will know the childhood sufferings and search for identity through short stories
- > The student will learn the myths and ethics of Indians
- > The student will know how to write the script
- > The student will be inspired by various motivational writings

UNIT I: POETRY (DETAILED)

1.	Aurobindo	:	Rose of God
2.	Toru Dutt.	:	Lakshman
3.	Nissim Ezekiel	:	A Very Indian Poem in Indian English
	(Non-Detailed)		
1.	Shiv. K. Kumar	:	Indian Women
2.	A.K Ramanujam	:	Epitaph on a Street Dog
3.	Jayanta Mahapatra	:	Grandfather
4.	Sarojini Naidu	:	Bird Sanctuary

UNIT II: PROSE (DETAILED)

Jawaharlal Nehru	:	Discovery of India-Through the Ages
Ananda Coomarasamy	:	Dance of Shiva
J.Krishnamurthi	:	The Rich and the Poor

UNIT III: DRAMA

Badhal Sarkar	:	Mad Horse
Asif Chrrimbhey	:	The Refugee

UNIT IV: FICTION (NON-DETAILED)

1.	Shashi Despande.	:	That Long Silence
2.	Anita Nair	:	Ladies Coupe
3.	Gita Mehta.	:	River Sutra
UNIT	V: CRITICISM		
1.	Meenakshi Mukherjee	:	"Nation,Novel,
			Language" in The Perishable Empire
2.	Gajendra Kumar	:	"Kaleidoscopic
			Dimensions of Indo-Angelian
			Novel Criticism: From Colonialism to Post- Colonialism" from Indian English Literature: A
			New Perspective.
3.	Barathamuni	:	From Natya and Rasa: Aesthetics of Dramatic
			Experience

REFERENCE

- 1. Karnad, Girish Collected Plays Vol. I. New Delhi : Oxford University Press, 2005.
- 2. Deshpande, Shashi_That Long Silence-Penguin 1998
- 3. Biswal k. Jayant. *A Critical Study of the Novels of R.K.Narayan.*. The comedy. Nirmalpublishers, New Delhi, 1987
- 4. Gajendra Kumar. *Indian English Literature*: A New Perspective.Sarup and Sons, New Delhi
- 5. *A history of Indian English Literature*: M.K. Naik (New Delhi : Sterling Publishers), 1985.
- 6. *Readings from Commonwealth Literature*: William Walsh (Oxford: Claredon Press), 1973.
- 7. The Third World Literature: Trevor James, London, 1986.
- 8. *An Anthology of Commonwealth Poetry:* C.D. Narasimhaiah (ed), (Madras: Macmillan), 1990.

PAPER - 4 ADVANCED LINGUISTICS

OBJECTIVES

- To enrich learners with the knowledge of the scientific study of language and to provide insights into the nature of language.
- To familiarize learners with the discourse of linguistics and to provide exposure to the variety of theoretical and practical manifestations of linguistics.
- To enable students to gain an informed approach on how language interfaces with literatures as well as with societal concerns and also to show how it feels into the discipline of cognitive sciences.

UNIT PLAN

- ✤ The student will be able to understand the importance of language
- ✤ The student will learn how the language has emerged
- The student will understand the systematic approach of language

COURSE OUTCOME:

- > The student will follow the proper pronunciation of the words
- > The student will learn how to communicate effectively in various places
- > The student will easily know the difference between linguistics and non- linguistics
- > The student will link the relationship between language and literature
- > The student will enjoy the dialects of various places and persons
- > The student will think about the multi- lingualism

UNIT I:

Nature of Language: Human and non-human systems of communication; Design features of language, Linguistics form (free and bound), Saussurean Dichotomies, Psychology of language, Language and the Brain, Language and Mind.

UNIT II:

Phonetics and Phonology: Articulatory, Auditory and Acoustic Phonetics. The Anatomy and Physiology of Speech. Phonetic Transcription. Initiation of Speech. Consonants and Vowels and their Classification. Supra segmental elements. Acoustic Characteristics of Speech. Phoneme, Phonology- all Processes and Features .

UNIT III:

Morphology: Morph, Morpheme, Allomorph, Morphological processes, Compounds, Analyzing Morphological Structure, Word classes, Morphological Properties of English verbs, Word Formation.

UNIT IV: Syntax and Semantics

Phrase Structure Grammar, Transformational grammar, Rules and Constraints on rules, Theory of Govt. and Binding: Universal Grammar, Innateness Hypothesis, Types of meaning, Semantic Relations, Pragmatics.

UNIT V: APPLIED LINGUISTICS

a)	Stylistics	:	The relationship of language to literature, Style and Function, Poetic discourse, narrative discourse and dramatic discourse.
b)	Language Disorders	:	The brain and Language organization, Aphasia, Dyslexia, Dysgraphia, Clinical Syndromes
c)	Lexicography	:	Monolingual dictionary, Inter-lingual dictionary, Structure and Equivalences, Problems of Untranslatability, General and special purpose dictionaries.

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- Aitchison, J. 1995. Linguistics: An Introduction. London: Hodder & Stoughton.
- Akmajian, A., Demers, R., Farmer, Harnish, R. 199001996. *Linguistics: An Introduction to Language and Communication Cambridge*, -Massachusetts: MIT Press. (Indianreprint, 1996, Prentice Hall).
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CORE ELECTIVE

PAPER 1

(TO CHOOSE ANY 1 OUT OF THE GIVEN 3)

A. INDIAN WRITING IN TRANSLATION

COURSE OBJECTIVE

- This evokes a concentrated imaginative awareness of experience or a specific emotion
- In prose we can see the technique of language that exhibits a natural flow of speech and grammar
- It can be viewed as an exploration of meaning and identity in the turmoil of changing social structure
- It demonstrates that the author supported the struggle from the point of the field hands
- It highlights the failing values present in the Post-Independence Indian Society.

UNIT PLAN

- It has tremendous appeal for children and it is the best way of exhibiting their love for the language.
- It lays the foundation for the appreciation of the beauty of language. The rhythm of these poems helps the students to acquire natural speech rhythm
- It enables the learners to extend their knowledge of vocabulary and structures and to become more proficient in the four language skills.
- It develops the ability of speaking English correctly and fluently. The main aim is to develop the language ability of the students.

COURSE OUTCOME

- To demonstrate the understanding of the social and artistic movements that have shaped theatre and dance as we know it today.
- Apply discipline to specific skills in learning creative performance. Analyze and interpret texts and performances both in spoken and written form.
- This encourages economy of setting, concise narrative and the omission of a complex plot: character is disclosed in action and dramatic encounter but is seldom fully developed.
- Despite its relatively limited scope a short story is often judged by its ability to provide "a complex" or justifying treatment.
- We can demonstrate knowledge and comprehension of major texts and traditions of language and literature written in English as well as their social, cultural, theoretical and historical contexts.

UNIT I : POETRY

Kabir	:	Poems 1,2,12,36,36 from
		One Hundred poems of Kabir
Kalidasa	:	Meghadutam
Mirabai	:	I sing for him Joyfully
Amir Khusrau	:	Colour me in Colours of Love
Amrita Pritam	:	The Revenue Stamp

UNIT	' II: PROSE			
	Samarth Ramsay		:	Dasbodh
	Sarathkumar Mukopathy	aya	:	Gulabjamun
	Sivasankarapillai		:	In the Flood
	Motilal Jotwani		:	A desire to see the sky
UNIT	' III: DRAMA			
	Mohan Rakesh	:	Halj	f-way House
	Indira Parthasarathy	:	Nan	dhan Kathai (Tr. C.T.Indira)
UNIT	IV: SHORT STORY			
	Khushwant Singh	:	Kar	ma.
	Pudumai Pithan	:	Fait	h
	Mahim Bora	:	Katl	nanibarighat
UNIT	V: FICTION			
	Pazhamalai	:	San	angalin Kathai
	Irawati Karve	:	Yug	unta

REFERENCE

- 1. Mukherjee, Meenakshi *The Perishable Empire* UK: Oxford University Press, 2004.
- 2. Sivasankari *Knit India Through Literature* Vol. II & III. Chennai: East West Books Pvt. Ltd, 2004.
- 3. Arvind Krishna Mehrotra, ed. *An Illustrated History of Indian Literature in English* New Delhi: Permanent Black, 2003
- 4. Kumar, Dilip. D. *Contemporary Tamil Short Fiction* Madras: Manas East West Books, 2005.
- 5. *One hundred poems of Kabir* translated by Rabindranath Tagore: Chronicle books. An imprint of DC publishers, New Delhi, 2003

WEB SOURCES

Songs of Kabir Tr by Rabindranath Tagore: <http://www.sacred-texts.com/hin/sok/index.htm> Mahim BoraKathanibarighat: https://indianreview.in/fiction/kathanibarighat-mahim-bora-assamese-short-storiestranslated-lalit-saikia/

CORE ELECTIVE

PAPER 1

B. FOURTH WORLD LITERATURE

OBJECTIVE

- To make the student acquaint the Knowledge about the Marginalized and exploited.
- To understand the exploitation of the Aboriginal population.

UNIT PLAN

- ◆ The student will be able to know the indigenous nature of the people.
- ◆ The student will come to know the socio-economic condition of the people.
- ✤ The student will understand the concept of fourth world literature.

COURSE OUTCOME

- The student will be able to know the sufferings of the natives of different countries.
- > The student will understand the desires and longings of natives
- > The student will come to know the dream and dark side of the people

UNIT 1:

N. Scott Momaday - Introduction to Fourth World Literature - world council of Indigenous peoples in 1972 - Native people of America

UNIT 2:

Aboriginals of Australia - dark side of the dream : Australian literature and the post Colonial mind.

UNIT 3:

Patricia Frances Graces : Maoris, Literature of New Zealand

UNIT 4:

George Copway : Indigenous First Nations Literature of Canada

UNIT 5:

Dalit literature and tribal literature of India.

Aarjundangle	:	Poisoned bread
Om Prakashvalmiki	:	Joothan

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- 1. Hodge, B. and Mishra, V. (1991) *Darksideofthedream*: *Australianliteratureandpostcolonialmind*, Allen and Unwin, Sidney, Australia.
- 2. Illaiah, Kancha. *Post- Hindu India : A discourse on Dalit- bahujan, socio-spiritual and scientific revolution*. New Delhi: sage Publications India pvt. Ltd. 2009.
- 3. Mani, Braj Ranjan. *Debrahmanizing history :Dominanceand* resistance. New delhi manohar publishers, 2008

CORE ELECTIVE

PAPER 1

C. FOLK TALE AND MYTH

COURSE OBJECTIVES

- King Arthur wanted the knights in his court to be considered equal. He did not want to fight
- The Metamorphosis almost never depicts love affairs or loving relationship that end happily
- It believed that those who pray to Lord Varadya and touch the two sacred lizards on their way are relieved from chronic diseases.
- Of the aesthetic values of modern critics connected with the general school of mythical view myth seems to be out-and-out rational.

UNIT PLAN

- He tells the company about his occupation as combination of itinerant preaching, selling promises for salvation.
- He gives a similar sermon to every congregation and then breaks out of his selling relics which he readily admits to the listening pilgrims as fake.
- King Arthur wanted the knights in his court to be considered equals: he did not want them fighting over status or rank.
- ✤ The Round Table since it was round represented Chivalry in its highest form.
- In this the narrator prays to the gods for inspiration, lays out his theme and states his intentions to write a single continuous poem. Secondly the narrator describes the creation of the world. The only survivors were Deucalion and Pyrrha, Pious people.

COURSE OUTCOME

- > As per another legend, the disciples of Gautama were cursed to become lizards.
- They resided in the temple and were relieved of the curse by the divine grace of Vishnu. There is a panel in the temple were the two lizards are depicted in the roof of the temple.
- The unit designates a critical approach in literary studies and also an eclectic approach to study the complex relationship between literature and myth.
- In short complex, critical and theoretical questions about myth and literature continue to be asked

UNIT I

Geoffrey Chaucer	:	The Pardoner's Tale
Pindar	:	Olympia XI (Trans. By Richmond Lattimore)
Christopher Marlowe		: The Passionate Shepherd to His Love
Sir Walter Raleigh	:	The Nymph's Reply to the Shepherd

UNIT II

01/11/11		
Phyllis Briggs (Retold)	:	King Author and the Knights of the Round Table
UNIT III		
Ovid	:	Metamorphoses – Book VIII (Lines 1-60)
UNIT IV		
Herman Hesse	:	Siddartha
Mark Twin	:	A Genuine Mexican Pug
Julian Huxley	:	The Sacred Lizard
Aesop	:	1) The Town Mouse and The Country Mouse
-		: 2) The Fox and the Grapes
		: 3) The Goatherd and the Wild Goats
UNIT V		
M.H. Abrams		: Introduction to Myth, Folklore
A. Joseph Dorairaj		: Theories of Myth: From Cassier to Frye
B. Das		: Myth Criticism and its Value
		-

REFERENCE

- 1. Kearns, George. *Macmillan Literature Series: English and Western Literature*, Glencoe Publishing Company, California, 1984.
- 2. Briggs, Phyllis. *King Arthur and the Knights of the Round Table*, Dean and Sons Ltd., London, 1984.
- 3. Abrams, M.H. and Geoffery Galt Harpham, A Glossary of Literary Terms, Cengage Learning, 2012.
- 4. Dorairaj, A. Joseph, *Myth and Literature*, Folklore Resources and Research Centre, 2003.
- 5. Ed. Rajnath, *Twentieth Century American Literature*, Arnold Heinemann Publisher, 1977.
- 6. Hesse, Hermann, *The Glass Bead Game*, Vintage Books, 2000.
- 7. Ed. Cong, Raymond, *African Tales*, Evans Brothers Ltd., 1967.
- 8. Narayanan, R.K. Swami and Friends, Indian Thoughts Publications, 2008.
- 9. Mccullough, Kelly, *Web Mage*, Berkley Publications, 2006

OPEN ELECTIVE PAPER 1 (TO CHOOSE ANY 1 OUT OF THE GIVEN 3)

A. LITERATURE FOR SOCIAL TRANSFORMATION

OBJECTIVE

- To help students understand the relevance of Literatures for Social Transformation
- To enable students understand the society through the prescribed texts

UNIT PLAN

- ✤ The student will understand the link between literature and society
- ✤ The student will be able to know the importance of ethics and spirituality
- ✤ The student will understand the mythological characters and imagination
- The student will come to know the ethical values and punishment for sinners by god

COURSE OUTCOME

- > The student will come to know the conditions of pre- independent India
- > The student will realize the contemporary situation in society
- > The student will know how the materialistic world dominates humanism
- The student will able to know the nature of knowledge and what is essential for students to learn
- > The student will be able to know how to write the satirical tone of prose
- The student will be able to understand the conditions and sufferings of the working classes

UNIT I : POETRY

William Blake grain of	_	From 'Auguries of Innocence' To see a world in a sand shall never be belov'd by men (26 lines)
P.B. Shelley	_	Prometheus Unbound
Ogden Nash	_	Bankers Are Just Like Anybody Else Except Richer

UNIT II: PROSE

John Ruskin	—	Unto this Last
Henry Newman	_	The Idea of a University

UNIT III: FICTION (SHORT STORY)

O'Henry	—	The Cop and The Anthem
Liam O'Flaherty	_	The Sniper
Tayeb Salih	_	A Handful of Dates
Luigi Pirandello		– War
Samuel Johnson	_	The Lure of Lottery

UNIT IV: DRAMA

Anton Chekhov – The	Cherry	Orchard
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UNIT V: GREAT ORATORIES

Abraham Lincoln –	Gettysbery Speech
Mahatma Gandhi –	Women Not The Weaker Sex
Jawaharlal Nehru –	Tryst with Destiny
William Shakespeare	– Mark Antony (Julius Ceasar)

BOOK FOR REFERENCE

- Rene Wellek *Literature and Society*
- Malik& Raval, "Law and Social Transformation in India:, Allahabad Law Agency.
- Dr. G.P. Tripathi, "Law and Social Transformation", Central Law Publications.
- Mark Clapson, "Suburban Century: Social Change and Urban Growth in England and the United States".
- David Braybroke Bryson and Brown Peter K. Schotch, "*Logic and the Tragic of Social Change*", Oxford University.

OPEN ELECTIVE PAPER 1 B. GREEN CULTURAL STUDIES

OBJECTIVES

- To expound to the learners the interdisciplinary nature of the course and to sensitise the learners on grave ecological concerns
- To render a historical perspective of the said criticism
- To familiarize the learners with the western eco-critical tools and to expose the learners to the relevant literature in the eco-critical realm
- To synthesise the western eco-critical tools with the eastern oiko poetic sensibilities
- To facilitate the understanding of eco-feminist theory and practice

UNIT PLAN

- ✤ The student will be able to understand the importance of nature
- ✤ The student will come to know how nature has been worshipped by human
- ✤ The student will be able to know about the concept of green studies.
- ✤ The student will understand the relationship between human beings and nature

COURSE OUTCOME

- > The student will learn about the endangered conditions of the earth
- > The student will get awareness and concentrate on the welfare of human life
- > The student will understand the connectivity between women and nature
- > The student will be able to know about the sufferings and the strength of nature
- > The student will get the beautiful landscapes and heritage of Tamil writings

UNIT 1 INTERDISCIPLINARITY

- 1. Joe Moran's Interdisciplinarity
- 2. Arne Naess' *Ecology, Community and Life style*
- 3. Sri. L.C. Jain's *Eco-spirituality For Communal Harmony*
- 4. Eco-spirituality
- 5. Fritjof Capra's The Web Of Life

UNIT 2 ECOCRITICAL STIRRINGS

- 1. Jonathan Bate's The Song Of The Earth
- 2. The Green Studies Reader
- 3. The Ecocriticism Reader

UNIT 3 INDIAN CLASSICAL OIKO POETICS

- 1. The Abhijnanasakuntalam of Kalidasa
- 2. P.T. Srinivasa Iyengar's "History Of The Tamils"
- 3. A.K. Ramanujan's "The Interior Landscape"
- 4. Tolkaappiyam: Akatti Naiiyal
- 5. Tinai

UNIT 4 WORDSWORTH, EMERSON, THOREAU AND ECO-CRITICISM

- 1. William Wordsworth's "*The Prelude*"
- 2. Jonathan Bate's "*Romantic Ecology*"
- 3. Selected Essays, Lectures and Poems of Ralph Waldo Emerson
- 4. Twentieth Century Interpretations of Walden
- 5. Lawrence Buell's *The Environmental Imagination*

UNIT 5 ECO-FEMINISM

- 1. Universal Declaration of the Rights of Mother Earth
- 2. Karen J. Warren- Introduction to Eco-feminism
- 3. Vandana Shiva- Women in the Forest
- 4. Margaret Atwood- *Surfacing*
- 5. Susan Hawthorne- Earth's Breath

REFERENCE

- Adamson, Joni. *American Indian Literature, Environment Justice and theEcocriticism.* Tucson: The University of Arizona Press, 2001.
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- *The Song of the Earth*.London:Picador,2000.
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E-RESOURCES

- Harding, Stephen. *What is Deep Ecology?* http://www.schumachercollege.org.uk/learningresources/what-is-deep-ecology>. Web.
- Proposal of Bolivia to Rio+20. Universal Declaration of the Rights of MotherEarth.<http://motherearthrights.org/universal-declaration/>. Web.
- Roy, Arundathi. The Greater Common Good
- <http://www.outlookindia.com/article.aspx?207509>. Web.

WEBSITES

- www.ecofem.org/journal
- www.spiritoftrees.org/
- www.navdanya.org/
- www.ecofem.org/
- www.resurgence.org/
- www.bhoomimagazine.org/
- www.greenbeltmovement.org
- www.successconsciousness.com

MAGAZINES

- "Bhoomi"
- "Environment" [USA]
- "Environment Action" [UK]
- "Life Positive" [India]
- "National Geographic"
- "Resurgence" [UK]
- "Sierra" [USA]
- "The Ecologist Asia" [India]
- "The Ecologist" [UK]

OPEN ELECTIVE PAPER 1

C. PUBLIC SPEAKING AND CREATIVE WRITING

OBJECTIVES

- To help students understand the techniques of Creative Writing
- To give practice in Writing
- To enable students write any Creative Form of Literature

UNIT PLAN

- The student will be able to understand the features of writings
- The student will be able to understand how to proof read and edit
- The students will be able to become the best writer with unique styles
- The student will understand the taste of poem

COURSE OUTCOME

- > The student will learn how to appreciate and analyze the poem
- > The student will get an idea of how to write poem
- > The student will receive the adequate knowledge about the paragraph writing
- The student will become a good writer after getting the ideas about writing methods
- The student will be able to know how to differentiate between fiction and nonfictional writings.

UNIT I

- 1. Writing and Thinking
- 2. Finding Ideas
- 3. Thinking about purpose, audience and tone
- 4. Arranging Ideas
- 5. Writing a First Draft Evaluating & Revising
- 6. Proof reading and publishing
- 7. Lateral Thinking

UNIT II

- 1. Writing a Poem
- 2. Poetic Analysis
- 3. Literary Devices
- 4. Exercises

UNIT III

- 1. Non Fictional Writing
- 2. Paragraph Structure
- 3. Writing an Introduction

- 4. Writing a Conclusion
- 5. Exercises

UNIT IV

- 1. Writing a Short Story
- 2. Pre-Writing
- 3. Basic Elements
- 4. Basic Framework
- 5. Exercises

UNIT V

- 1. Screenplay Writing / Writing a Play
- 2. Literary Techniques
- 3. Production
- 4. Evaluation Pattern to be evolved

REFERENCE

- *Elements of writing* (Complete Course)James L. Kinneavy, John E. Warriner Austin: HBJ,1993
- *Elements of Writing* (Fourth Course) James L. Kinneavy, John E. Warriner Austin: HBJ,1993
- Rudolf f. Verdure and Kathleen S. Verdure: *The Challenge of Effective Speaking*, Thomson Wadsworth 13th ed., 2006.
- Stephen King, On Writing. www.amazon.net.
- Kamath, M.V Professional Journalism. New Delhi: Vikas Publication.
- Edward De Bono, Six thinking hats, Little Brown and company.

SEMESTER II

PAPER - 5

BRITISH DRAMA

COURSE OBJECTIVES

- This course seeks to aid the students in the acquisition of communication skills.
- The course will demonstrate the proficiency in oral communication.
- The students will also acquire and develop histrionic skills.

UNIT PLAN

- They will demonstrate proficiency in specific skills like: acting, directing, choreography, play writing or dramaturgy.
- They will be able to analyze, interpret and evaluate the dramatic literature and theatrical productions.
- Students in drama and theatre arts will learn the importance of responsibility to their community.

COURSE OUTCOME

- > Apply discipline specific skills to the creation of performance
- Draw connections between theatrical practices and social contexts in both modern and pre-modern periods.
- They will demonstrate proficiency in specific skills like: acting, directing, choreography, play-writing or dramaturgy.
- They will be able to analyze, interpret and evaluate the dramatic literature and theatrical productions.

UNIT – I: BRITISH DRAMA UP TO 17TH CENTURY

- 1. Introduction to the development of British drama
- 2. Christopher Marlowe *Doctor Faustus (Detailed)*
- 3. Ben Jonson *Everyman in His Humor (Non-detailed)*

UNIT II: UPTO 19TH CENTURY

1.	Oscar Wilde	-	The Importance of Being Ernest (Detailed)
2.	Harold Pinter	-	The Birthday Party (Non-detailed)

UNIT - III: 20TH CENTURY UPTO 1950

- 1. T.S.Eliot Murder in the Cathedral (Detailed)
- 2. Bernard Shaw Saint Joan (Non-detailed)
UNIT - IV: 20TH CENTURY AFTER 1950

1.	Peter Shaffer	-	Amadeus (Detailed)
2.	Tom Stoppard	-	Rock n Roll (Non-detailed)

UNIT – V: TEXT FOR SEMINAR

1.	John Webster	-	The Duchess of Malfi
2.	Oliver Goldsmith	-	She Stoops to Conquer
3.	Sheridan	-	The School for Scandal.
4.	Agatha Christie	-	The Mouse Trap

REFERENCE

- 1. Colin Chambers; Mike Prior. *Playwrights' Progress : Patterns of Postwar British Drama*. Amber Lanes Press.1987.
- 2. Dan Rebellato. 1956 and All that : The Making of Modern British Drama. Routledge. 1999.
- 3. Elizabeth Hale Winker . *The Function of Song in Contemporary BritishDrama*. University of Delaware Press.1990.
- 4. Frances M. Kavenik. British Drama, 1660-1779: A Critical History .Twayne.1995.
- 5. Gabriele Griffin. *Contemporary Black and Asian Women Playwrights in Britain*. CUP. 2003.
- 6. John Russell Taylor. *Anger and After : A Guide to the New British Drama*. Penguin Books. 1963.

PAPER – 6

TRANSLATION THEORY AND PRACTICE

OBJECTIVE

- To make the students learn about the history of translation.
- To understand the challenges and identify the problems of translation.
- To carry out translation exercises.

UINIT PLAN

- ✤ Knowing the base of translation.
- ✤ To recognize the impact and aspects of translation.
- To understand the target language and its art of process, products and reproduction of translation.

COURSE OUTCOME

- > The learner knows about the history of translation and its practice.
- ▶ Interpretation of SL and TL can be done.
- > Reproduction of the translation and the process and product can be understood.
- Problem and solution of the translation and the equivalence of the translation can be learned.
- > Translation is done in practice.

UNIT I

A Brief History of Translation

Translation Theory and its Aspects

UNIT II

Translation Procedure Interpretation of the Source Language (SL) Text and Transfer of meaning and communicative effects to the Target Language (TL) Text

UNIT III

Is Translation an Art or Science? Translation and Reproduction, Process and Product

UNIT IV

Problems in Translation Fidelity and Truth in Translation Complete Equivalence vs. Creativity Literal and Free Translation – Translation – Creation, Transcription and Creative Translation

UNIT V

The Practice of Translation (Exercise from Literary Translation) 1 from Tamil to English and 1 from English to Tamil

REFERENCE

Eugene A. Nida and Charles R.Taber	_	The Theory and Practice of Translation
Susan Bassnett and Mequire	_	Translation studies
Newmark Peter	_	Approaches to Translation
Susan Bassnett and Lefevere Andre	_	Translation, History and Culture
H.Lakshmi	_	Problems of Translation

PAPER - 7

CONTEMPORARY LITERARY THEORY - I

OBJECTIVES

- To help the students understand literary theory as a system to critically interpret literary texts.
- To enable the students to understand the broad spectrum of thought that is covered by literary theory and also to enhance their literary research.

UNIT PLAN

- Enhances the students to develop critical skills, analysis and many other communication skills-oral and written.
- ✤ The students are finally equipped with various tools, techniques and strategies of interpretation.

COURSE OUTCOME

- ➢ It reinforces the student's literary competence.
- > The students will develop an independent critical persona.
- > The students can understand the various types of theories
- \succ Theories after the 20th century is learned

UNIT I

New Criticism

Russian Formalism

UNIT II

Psychoanalysis

Archetypal Criticism

UNIT III

Reader Response Theory

Phenomenological Criticism

UNIT IV

Bakhtin

Eco criticism

UNIT V

Modernism

Post-Modernism.

REFERENCE

- 1. Barry, Peter, *Beginning Theory* (Routledge, London, 2010).
- Selden, Raman. A Reader's Guide to Contemporary Literary Theory. (Pearson, Singapore,2009).
- Lodge, David and Nigel Wood (ed.). *Modern Criticismand Theory* (Pearson, Essex, 2008).
- Waugh, Patricia. *Literary Criticism and Theory*. (Oxford University Press, Oxford, 2008).

CORE ELECTIVE PAPER 2 A. COMPARATIVE LITERATURE

OBJECTIVES:

- To acquaint students of literature with a knowledge of using comparison as a tool of criticism.
- To help students have a broad outlook on literature as Comparative Literature involves 'Mutual Illumination'

UNIT PLAN

- To go beyond mere comparative study of texts to include issues of nation, caste, race, gender, region, culture etc.
- In the analysis of texts as well as issues related to the history of print and publishing also form topics studied under the rubric of Comparative Literature.
- ✤ To enable students to explore research areas in the core subjects of thematology, genealogy, literary history, literary influence, and reception, besides related fields of performance studies, theatre studies, film studies etc.

COURSE OUTCOME

- > The student will know about the definition and Origin of the Comparative Literature.
- > Influence and Imitation of the subject is taught.
- > The link between Comparative Literature and the literary History is exposed
- > The Comparison between the genres is taught to the learners.
- > The comparison of Themes were taught to the students.

UNIT-I:

Definition of the term Comparative Literature – National Literature – World Literature and Comparative Literature – French School and American School, German School and Russian School.

UNIT-II:

Influence and Imitation – Unconscious Imitation and Conscious Influence – Translation –Influence Studies and Analogy Studies – Comparing Dante's The Divine Comedy with Sri Aurobindo's Savithri (The Book of Forest in The Mahabharatha)

UNIT-III:

Epoch, Period and Generation – the Link between Comparative Literature and History of Literature – The difference between Epoch, Period and Generation

UNIT-IV:

Genres – Comparing two Texts on the basis of Form – Comparing Novels, Plays and Poems – Variations – a Drama and an Epic also can be compared based on the Common Qualities – Comparing Burns with Bharathidasan (Burns' 1. Bessy and Her Spinning Wheel 2. Banks of Crea 3. As I went out on May Burning 4. Broom Resoms 5. Auld Rob Morries with Bharathidasan's translated version of Tamizhachiyin Katti) and Bacon with Valluvar, Kamban with John Milton.

UNIT-V:

Thematology – Comparing Works on the basis of Themes – Defining terms like Motif, Leitmotif – Characters and Situations. In addition to these, the teacher can illustrate the Study of Comparative Literature by Comparing Nathaniel Hawthorne's *The Scarlet Letter* and *Ananda*. V.R. Ananthamurthy's *Samskara*, Shakespeare's *Antony and Cleopatra* with Dryden's *All for Love*, Gayathri Spivak's *Death of a Discipline*

TEXT BOOKS:

- 1. Brooks, Cleanth and Robert Penn Warren. *Modern Rhetoric*. Atlanta: Harcourt,Brace& World, 1958. Print.
- 2. Mohan, Devinder. *Comparative Poetics: Aesthetics of the Ineffable*. New Delhi: Intellectual Publishing House, 1988. Print.
- 3. Peck, John and Martin Coyle. *Practical Criticism*. New York: Palgrave, 1995.Print.
- 4. Daiches, David. Critical *Approaches to Literature*. Kolkata: Orient Longman, 2006. Print.
- 5. Spivak, Gaythri Chakravorthy. *Death of a Discipline*. Columbia: Columbia University Press, 2003. Print.

REFERENCES:

- Subramaniam, N, Srinivasan, Padma & Balakrishnan G.R. eds. *Introduction to the Study of Comparative Literature Theory and Practice*. Tamilnadu: Teesi Publications, 1997. Print
- *"Comparative Literature"*, Ed :Bijay Kumar Das, Atlantic Publishers, 2012.
- "Glimpses of Comparative Literature", Ed :Pradhan Pam Prakash, Atalntic Publishers.
- "Studies in Comparative Literature", Ed: Mohit K. Ray, Atlantic Publishers.
- *"India and Comparative Literature: New Insights"*, Ed: R.K. Dhawan and Sumita Puri, Prestige Books Publishers.

CORE ELECTIVE PAPER 2 B. NEW LITERATURE IN ENGLISH

OBJECTIVES:

- The course aims to develop the students in a comprehensive understanding of the finest works English, belonging to post-colonial countries.
- To familiarize with some of the greatest writers and cultures in those countries.

UNIT PLAN

- Critically examines the New Literature thoughts and pain expressed through the various work.
- Poetry discusses the cultural pain of the people.
- ✤ The expression of Woman to her child are expressed.
- Psychological thoughts on Telephone Conversation.
- Modernity is experienced through the narration.

COUSE OUTCOME

- The Learner can experience the poetry from various countries such as Canada, Australia and New Zealand.
- Can understand the Alienation among the works of the writers who belongs to different regions
- > The Criticism of the New Literature is also taught to the students.

UNIT I - POETRY

DETAILED: CANADIAN POETRY

Desi Di Nardo	:	Summer Sonata
Mark Strand	:	The Story of Our Lives
AUSTRALIAN POETRY		
Judith Wright	:	Woman to Child
Jennifer Maiden	:	Tactics
Elizabeth Campbell Donaldson	:	Days
NON- DETAILED: AFRICAN POETR	RY	
Wole Soyinka	:	Telephone Conversation
Derek Walcott	:	A Far Cry from Africa
NEW ZEALAND POETRY		
Katherine Masfield	:	A Little Boy's Dream
Faye Kilday	:	Do You hear the Angel Speaking

UNIT II – PROSE

S	Stuatr Hall	:	Cultural Identity and Diaspora	
I	Nadine Gordimer	:	Nobel Prize Acceptance Speech	
UNIT I	II – DRAMA			
1	Uma Parameswaran	:	Rootless but Green are the Boulevard	
			Trees (Detailed)	
l	Mahasweta Devi	:	Mother of 1084 (Non-Detailed)	
UNIT IV – FICTION				
J	JM Coetzee	:	Disgrace	
]	Peter Kelly	:	The History of the Kelly Gang	
UNIT V	V – CRITICISM			

Louis Dudek	:	Poetry in English
E.H. McCormick	:	Close of a Century

REFERENCE

- Narasimaiah, C.D Ed, *An Anthology of Commonwealth Poetry*, Macmillan Publication, 2013.
- J O Donnell, J.O. Maragaret, An Anthology of Commonwealth Verse, Blackie and Sons Publication, 2004.
- Hall, Stuart, *Colonial Discourse and Postcolonial Theory A Reader*, Harvest Whaeatsheaf Publication, 2009.
- Gordimer, Nadine, www.nobelprize.org/nobel prize/literature/laureates/1991/gordimer lecture.html, Gordimer lecture.html, 1991.
- Parameswaran, Uma, Sons must Die and Other Plays, Prestige Books, 2006.
- Devi, Mahasweta, *Mother of 1084*, Seagull Books, 2011.
- Coetzee, J.M, *Disgrace*, Vintage Publications, 2000.
- Kelly, Peter, *The History of the Kelly Gang*, Faber Publications, 2012.
- Walsh, William, *Readings in Commonwealth Literature*, Clarendon Press Publication, 2005.

CORE ELECTIVE PAPER 2

C. SUBALTERN LITERARY STUDIES

OBJECTIVES

- To introduce students to that literature that has been sidelined down the ages.
- To familiarize the students with the theme of the Subaltern.
- To picturise the painful feelings of the oppressed.

UNIT PLAN

- Experience of the Socially, Politically, economically neglected people can be understood.
- Modern Subaltern culture will be exposed.
- ✤ Identification of Gender discrimination in the given works.
- Subaltern thoughts are discussed via Criticism.

COURSE OUTCOME

- > The learner can re-explore the political, social and economic role in literature.
- Can understand the feelings of the exploited.
- > The analysis of political role in the subaltern literature can be done.
- Critical Analysis of the text and theme can be undertaken by the learner.

UNIT I: POETRY

John Betjeman	:	A Subaltern's Love Song
Mervyn Gooneratne	:	There was a Country
Langston Hughes	:	The Negro Speaks of Rivers
Syed Amanuddin	:	Don't Call Me Indo – Anglian
Mervyn Morris	:	Judas

UNIT II: PROSE

Homi.K. Bhabha	:	The Location of Culture
Dipesh Chakrabarty	:	A Small History of Subaltern Studies : 2000 from
		Habitation of modernity Essays in the wake of
		Subaltern studies pp (3-19)
Salman Rushdie	:	Imaginary Homelands Chapter – I

UNIT III: DRAMA

Doloress Prida	:	Beautiful Senoritas
UNIT IV: FICTION		
Benjamin	:	Jasmine Days (translated by Shanaz Habib)
UNIT V: CRITICISM		
K. Nirupa Rani	:	Gender and Imagination in Bapsi Sidhwa's Fiction
Mulkraj Anand	:	The Sourse of Protest in my novels
		(from "Creating Theory" ed. Jasbir Jain)
Gyan Prakash	:	Subaltern Studies as Postcolonial Criticism

REFERENCE

- Dipesh Chakrabarty, *A Small history of Subaltern studies*:2000. Habitation of modernity: Essays in the wake of subaltern studies. Chicago: el of Chicago p, 2002.
- Ranajit Grhe : On Some Aspects of the Historiography of colonial India. 1982.
- *Mapping Sub studies & the post colonial Ed.* Vinayak Chatuoudi London:2000.
- Spivak, Gayatri Chakraborti. "Subaltern Studies: Deconstructing Historiography." Ed.
- Ranjith Guha, "Writings on South Asian History and Society Vol IV. OUP, 1985.
- Gramsci, Antonio. "*History of the Subaltern Clases, Prison Notebooks Vol.II*, (ED.&Tr.) Joseph A. Buttigieg, Columbia UP, 1966.
- Fanon, Frantz. "Black Skin, Whote Masks, Grove, 1967.

OPEN ELECTIVE

PAPER 2

A. TECHNICAL WRITING

OBJECTIVES

- To introduce students to various styles and methods in technical writing
- To train students in skills required for a technical communicator

UNIT PLAN

To train students in using basic online packages and applications as tools of technical Writing.

COURSE OUTCOME

- Demonstrate an understanding of styles and methods in Technical Writing Locate, evaluate and use online packages and appliances effectively.
- Display skills required for a technical communicator, use visuals effectively, integrate the components of accuracy, brevity and objectivity in Technical Writing

UNIT 1 INTRODUCTION

- 1. What is Technical Writing?
- 2. Difference Between Technical and Academic Writing
- 3. The Scope of Technical Writing
- 4. The Role and Essential Skills of a Technical Communicator

UNIT 2 GUIDELINES AND GRAMMAR IN TECHNICAL WRITING

- 1. Basic Patterns and Elements of the Sentence
- 2. Common Grammar, Usage, Punctuation Problems
- 3. Writing with Clarity and Precision
- 4. The Fog Factor

UNIT 3 THE WRITING PROCESS

- 1. Audience Analysis
- 2. Task Analysis
- 3. Writing and Editing (Using Track Changes)
- 4. Communicating with Visuals

UNIT 4 APPLICATION OF TECHNICAL WRITING - I

- 1. Writing Proposals
- 2. Technical Reports: Survey Report

UNIT 5 APPLICATION OF TECHNICAL WRITING - II

- 1. Users' Manuals
- 2. Writing for the Web

BOOKS FOR REFERENCE

- 1. Blake, Gary and Robert W. *The Elements of Technical Writing*. Macmillan Publishers, 1993
- 2. Blicq, Ronald, S and Lisa Moretto. *Technically Write*!. Prentice Hall, 2004.
- 3. Marnell, Geoffrey. *Essays on Technical Writing*. Burdock Books, 2016
- 4. Reddy, Devaki and Shreesh Chaudhary. *Technical English*. Macmillan, 2009.
- 5. Rizvi, Ashraf M. *Effective Technical Communication*. Tata McGraw-Hill, 2006.
- 6. Samson, C Donald. *Editing Technical Writing*. Oxford UP, 1995.

ELECTRONIC RESOURCE

• Business Writing – Clarity, UK

OPEN ELECTIVE

PAPER 2

B. INDIAN DIASPORA LITERATURE

OBJECTIVE

- Definition and types of Diaspora Waves of Migration Patterns of Diaspora Major Diaspora Communities & Popular terms in Diaspora.
- Definition and types of migration patterns of migration domestic and global migration impact of migration.
- Ethnicity and identity of Diaspora context forming of identity major components of ethnicity identity detainment and amalgamation.

UNIT PLAN

- The root of Diasporic thoughts
- The broken feeling of the homelessness.
- Pictorial effect of global migration.
- ✤ Rootless identity of the diasporic communities.

COURSE OUTCOME

- > The learner can sketch the definition and scope of the Indian Diaspora Literature.
- > The meaning and usage of the term "diaspora literature".
- Diasporic Communities feelings can be understood from the various part of the countries throughout the world.
- > The circumstances for the formulation of Diasporic Communities can be experienced.

UNIT I – DIASPORA THEORY

Diaspora - Origin, Definition and Scope

Salman Rushdie: Imaginary Homelands from Rushdie's Imaginary Homelands

Jana Evans Braziel and Anita Mannur (ed.). *Modernity, Globalism, and Diaspora.* from Theorizing Diaspora : A Reader, Wiley, 2003.

Stuart Hall: *Cultural Identity and Diaspora* (In Williams, Patrick & Laura Chrisman eds. Colonial Discourse & Postcolonial Theory:

A Reader. Harvester Whaeatsheaf, 1993)

UNIT II – POETRY

A.K. Ramanujan- "Small Scale Reflections on a Great House"

R. Parthasarathy – "Home Coming"

Agha Shahid Ali: "Srinagar Airport", "Of Snow", "Memory",

(form The Final Collections, Orient Blackswan, 2004).

UNIT III – FICTION

Khaled Housseine	: The Kite Runner
V.S. Naipaul	: The Mystic Masseur

UNIT IV – DRAMA

Lorraine Hansberry	– A Raisin in the Sun
Julia Cho	– The Architecture of Loss
Pearl Cleage	– Flyin' West
Silvia Gonzalez	– The Migrant Farm worker's Son

UNIT V – SHORT STORIES

Gita Hariharan:	Ghosts of Vasumaster
Jhumpa Lahiri:	Unaccustomed Earth
Sunetra Gupta:	Memories of Rain
Chitra Banerjee Divakurni:	Sister of my heart

REFERENCE

- 1. English Literature Voices of Indian Diaspora- Malti Agarwal.
- 2. DIASPORA Theory and Translation Himadri Lahiri Ed. By Allen Hibbard. Pub Orient Blank Swan.
- 3. Writers of the Indian Diaspora-Jasbir Jain.
- 4. Migration and Diaspora in Mordan Asia. Sunil Amirth.
- 5. Translational Migration: The Indian Diaspora Ed. William Safran, Ajaya Kumar Sahoo, Briji V. All. South Asia Edition.
- 6. Indian Diaspora in the Caribbean : History, Culture and Identity- Ed by Rattanland Hangloo.

OPEN ELECTIVE

PAPER 2

C. JOURNALISM AND MASS COMMUNCATION

OBJECTIVES

- To enable the students to get knowledge of the press, its history and other media.
- To know the uses and Importance of the Mass Media.
- To get the knowledge of Print Media.
- To evaluate the worthiness of Media.

UNIT PLAN

- ✤ The role of Print Media
- Culture and characteristics design of newspaper.
- ✤ To input the techniques and writings of Media
- Evaluating the documentary record of the movie.
- Critical examine of the Advertisement.

COURSE OUTCOME

- > The students can learn about the history and Ideologies of the print media.
- > The Characteristic of the Newspaper is introduced to the learners.
- > The learners can acquaint the Techniques and writings of the Print Media.
- > The importance of the mass media in the society can be understood by the readers

UNIT I: HISTORY AND IDEOLOGIES OF PRINT MEDIA

The Press Council Act – 1978

News under Emergency

The Centenarian Newspapers in India

Ethics of a Newspaper

UNIT II: CHARACTERISTICS OF A NEWSPAPER:

Headlines

Interviews

Features

Letters to the Editor

Cartoons and Caricatures

UNIT III: TECHNIQUES OF WRITING FOR THE PRINT MEDIA

Report Writing The Role of an Editor Qualities of an Interviewer Book Review Film Review

UNIT IV: HISTORY AND STUDY OF FILMS

The Arrival of Talkies Lumiere Brothers and the Evolution of Cinematography Documentary and Short Films National Film Festival

UNIT V: USES AND IMPACT OF MASS MEDIA ON SOCIETY

Radio Journalism Television Journalism The Film Industry The web Media

REFERENCE

- 1. Journalism Theory and Practice: B.N. Ahuja, Sultan Chand Pub, New Delhi
- 2. Mass Communication in India :Keval K. Kumar, Jaico Publishing House
- 3. Basic Journalism : Rengasamy Parthasarathy, Macmillan publications.

ANNNAMALAI UNIVERSITY

BACHELOR OF SCIENCE B.Sc. MATHEMATICS DEGREE COURSE

(2021 - 2022)

The Course of Study and the Scheme of Examinations

S. No.	Part	Study Components Course Title		Ins. Hrs / week	Credit		Maximum Marks		
						Title of the Paper			
		SEMESTER I					CIA	Uni. Exam	Total
1	I	Language	Paper-1	6	4	Tamil/Other Languages	25	75	100
2	П	English (CE)	Paper-1	6	4	Communicative English I	25	75	100
3		Core Theory	Paper-1	5	3	Algebra	25	75	100
4	- 111	Core Theory	Paper-2	5	3	Trigonometry	25	75	100
5		Allied -1	Paper-1	4	3	(to choose any 1 out of 4)	25	75	100
6	- 111	Allied- 1	Practical-1	2	0	(For Practical Allied subjects)	0	0	0
7	Ш	PE	Paper 1	6	3	Professional English I	25	75	100
8	IV	Environmental Studies		2	2	Environmental studies	25	75	100
		Sem. Total		36	22		175	525	700
		SEMESTER II						· · ·	
		SEMESTE	R II				CIA	Uni. Exam	Total
8	1	SEMESTE Language	R II Paper-2	6	4	Tamil/Other Languages	CIA 25	Uni. Exam 75	Total 100
8 9	 	SEMESTE Language English (CE)	R II Paper-2 Paper-2	6 6	4	Tamil/Other Languages Communicative English II	CIA 25 25	Uni. Exam 75 75	Total 100 100
8 9 10	 	SEMESTE Language English (CE) Core Theory	R II Paper-2 Paper-2 Paper-3	6 6 4	4 4 3	Tamil/Other Languages Communicative English II Calculus	CIA 25 25 25	Uni. Exam 75 75 75	Total 100 100 100
8 9 10 11	 	SEMESTE Language English (CE) Core Theory Core Theory	R II Paper-2 Paper-2 Paper-3 Paper-4	6 6 4 4	4 4 3 3	Tamil/Other Languages Communicative English II Calculus Analytical Geometry of three dimensions	CIA 25 25 25 25 25	Uni. Exam 75 75 75 75 75	Total 100 100 100 100 100
8 9 10 11 12		SEMESTE Language English (CE) Core Theory Core Theory Allied-1	R II Paper-2 Paper-2 Paper-3 Paper-4 Paper-2	6 6 4 4 4	4 4 3 3 3	Tamil/Other Languages Communicative English II Calculus Analytical Geometry of three dimensions (to choose any 1 out of 4) (For Practical Allied subjects)	CIA 25 25 25 25 25 25	Uni. Exam 75 75 75 75 75 75	Total 100 100 100 100 100 100
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ANNNAMALAI UNIVERSITY

B.Sc. MATHEMATICS

SYLLABUS CBCS PATTERN (2021 - 2022)

SEMESTER I PAPER - 1 ALGEBRA

Objectives

In this Course students are exposed to topics like Theory of Equations, Summation of Series, Matrices, Continued Fractions and Elementary Number Theory. The stress is on the development of problem solving skills.

UNIT-I: THEORY OF EQUATIONS

Polynomial Equations – Relation between roots and coefficients - Symmetric Functions of roots in terms of Coefficients - Transformation of Equations - Reciprocal Equations.

UNIT-II: THEORY OF EQUATIONS (Contd...)

Descartes Rule of Signs - Approximate Solutions of Polynomials by Horner's method - Newton - Raphson method of Solving a Cubic Polynomial.

UNIT-III: SUMMATION OF SERIES

Summation of series using Binomial - Exponential and Logarithmic series (Theorems without proofs) - Approximation using Binomial, Exponential and Logarithmic series - simple problems.

UNIT-IV: MATRICES

Symmetric - Skew Symmetric, - Hermitian - Skew Hermitian - Orthogonal and Unitary Matrices - Eigen Values - Eigen Vectors – Cayley-Hamilton Theorem (without proof) - Similar Matrices - Diagonalisation of a Matrix.

UNIT-V: ELEMENTARY NUMBER THEORY

Prime Number - Composite Number - Decomposition of a Composite Number as a Product of Primes uniquely (without proof) - Divisors of a Positive Integer - Congruence Modulo n - Euler Function (without Proof) - Highest Power of a Prime Number p contained in n!- Fermat's and Wilson's Theorems (statements only) - simple problems.

Recommended Texts

T.K.Manicavachagom Pillay, T.Natarajan and K.S.Ganapathy.(2004) *Algebra*, Volume I & II S.Viswanathan Printers & Publishers Pvt. Ltd. Chennai.

Reference Books

- 1. P.Kandasamy, K.Thilagavathy (2004), Mathematics for B.Sc. Vol-I, II, III & IV, S.Chand& Company Ltd., New Delhi-55.
- 2. S.Arumugam (2003) Algebra. New Gamma Publishing House, Palayamkottai.
- 3. A.Singaravelu (2003) Algebra and Trigonometry, Vol.-I & II Meenakshi Agency, Chennai.
- 4. S.Sudha(1998) Algebra and Trigonometry, Emerald Publishers, Chennai.

Course Outcomes

At the end of the course the student will be able to

- [1] know the relationship between roots and coefficients.
- [2] identify the nature of the roots of the given equation .
- [3] evaluate sum to infinity of the given binomial, exponential and logarithmic series.
- [4] identify the types of matrices and calculate the Eigen values of a given square matrix.
- [5] know the number theory concepts.

PAPER - 2

TRIGONOMETRY

Objectives

This course is a fundamental one for many courses of this Degree Programme. This covers topics on the expansions of trigonometric functions, hyperbolic functions, inverse circular, inverse hyperbolic functions and it aims to develop computational skills.

UNIT-I

Expansions of $cosn\theta$, $sinn\theta$ in powers of $cos\theta$ and $sin\theta$ - Expansion of $tann\theta$ in powers of $tan \theta$ - Expansion of tan(A+B+C+...) - Formation of Equations. Chapter III section 1 to 3

UNIT-II

Powers of sines and cosines of θ in terms of functions of multiples of θ - Expansions of sin θ , cos θ and tan θ in a series of ascending powers of θ –Approximation problems - Expansions of Inverse Circular Functions. Chapter III Sections 4 and 5

UNIT-III:

Hyperbolic Functions: Definition – Relation between Hyperbolic and Circular Functions - Inverse Hyperbolic Functions. Chapter IV sections 1 to 2.3

UNIT-IV

Resolution into Factors - simple problems only - DeMoivre's Property on the Circle and Cote's Property on the Circle - Logarithm of complex quantities. Chapter V Sections 2 and 3(Problems only) 4, 4.1, 4.2, 5, 5.1, 5.2.

UNIT-V

Summation of Trigonometric Series: Method of Differences - Angles are in A.P, C+iS method of summation - Gregory Series - Euler Series. Chapter VI Sections 1, 2, 3, 3.1, 3.2.

Recommended Text

1. S.Narayanan and T.K. Manicavachagom Pillay (2004) *Trigonometry*.S.Viswanathan Printers & Publishers Pvt. Ltd. Chennai.

Reference Books

- 1. P.Kandasamy, K.Thilagavathy (2004), Mathematics for B.Sc. Vol.-I, II, III & IV, S.Chand & Company Ltd., New Delhi-55.
- 2. S.Duraipandian and LaxmiDuraipandian (1984) *Trigonometry*. Emerald Publishers, Chennai.
- 3. B.S.Grewal. (2002) Higher Engineering Mathematics. Khanna Publishers. New Delhi.
- 4. S.L.Loney. (1982) Plane Trigonometry, Part II, Cambridge University Press, London.
- 5. A.Singaravelu (2003) Algebra and Trigonometry, Vol.-I Meenakshi Agency, Chennai.
- 6. P.R.Vittal. (2004) Trigonometry, Margham Publications, Chennai.

Course Outcomes

At the end of the course the student will be able to

- [1] know the expansions of $\cos \theta$, $\sin \theta$ in powers of $\cos \theta$ and $\sin \theta$
- [2] expand powers of sines and cosines of θ in terms of functions of multiples of θ
- [3] know the concept of hyperbolic functions
- [4] know the logarithm of complex quantities
- [5] find the summation of trigonometric series.

SEMESTER II PAPER - 3 CALCULUS

Objectives

The course introduces students to the fundamental principles, concepts and knowledge in the areas of Differential and Integral Calculus. This prepares the students to apply these fundamental concepts and working knowledge to other courses.

UNIT-I: Differential Calculus

nth derivative - Leibnitz's theorem (Without proof) and its application - Jacobians - Total differential - Maxima and Minima functions of two and three independent variables - Lagrange's method (without proof) - Simple problems.

UNIT-II: Differential Calculus (Contd...)

Polar coordinates – Relation between Cartesian and Polar coordinates - Polar Equation of a Straight line, Circle and Conic only (Related problems not necessary) - Angle between radius vector and tangent – Angle between two curves – Curvature - Radius of Curvature in Cartesian and Polar coordinates.

UNIT-III: Differential Calculus (Contd...)

Centre of Curvature – Evolutes – Envelopes – Asymptotes – General method of finding asymptotes (First Section - Rational algebraic curves only).

UNIT-IV: Integral Calculus

Reduction formula for $sin^n x$, $cos^n x$, $tan^n x$, $sin^m x cos^n x$ - Beta and Gamma Functions - Properties and Problems – Definite Integral – Properties - Simple Problems.

UNIT-V: Integral Calculus (Contd...)

Double Integrals - Change of order of Integration - Triple Integrals - Applications to Area, Surface Area and Volume.

Recommended Text

S.Narayanan and T.K.Manicavachagom Pillay (2004) *Calculus*.S.Viswanathan Printers & Publishers Pvt. Ltd. Chennai.

Reference Books

- 1. P.Kandasamy, K.Thilagavathy (2004), Mathematic for B.Sc. Vol.-I, II, III & IV, S.Chand& Company Ltd., New Delhi-55.
- 2. Shanti Narayan (2001) Differential Calculus. Shyamlal Charitable Trust, New Delhi.
- 3. Shanti Narayan (2001) Integral Calculus. S. Chand& Co. New Delhi.
- 4. S.Sudha (1998) Calculus. Emerald Publishers, Chennai.
- 5. G.B.Thomas and R.L.Finney. (1998) Calculus and Analytic Geometry, Addison Wesley (9thEdn.), Mass. (Indian Print)
- 6. P.R.Vittal. (2004) Calculus, Margham Publication, Chennai.

Course Outcomes

At the end of the course the student will be able to

- [1] determine extreme values of the given function
- [2] know the concept of Cartesian and polar coordinates
- [3] gain the knowledge of curvature, evolutes and envelope concepts
- [4] solve integration problems
- [5] evaluate double and triple integrals.

PAPER - 4

ANALYTICAL GEOMETRY OF THREE DIMENSIONS

Objective:

To deepen the knowledge of the students in various concepts of Analytical Solid Geometry.

Unit I: Plane

General equation of a plane – Equation of a plane in the normal form – Angle between planes – Plane through three given points – Equation of a plane through the line of intersection of two planes.

UNIT II: Straight Line

Symmetrical form of a straight line – Image of a point with respect to a plane – Image of a line with respect to a plane – Length and equation of the shortest distance between two skew lines - Coplanar lines.

UNIT III: Sphere

Equation of the sphere – Length of the tangent – Tangent plane – Section of a sphere by a plane – Orthogonal spheres – Equation of a sphere through a given circle.

UNIT IV: Cone

Equation of a cone with a given vertex and a given guiding curve - Equation of a cone with its vertex at the origin - Condition for the general equation of the second degree to represent a cone - Right circular cone – Enveloping cone - Tangency of a plane to a cone.

UNIT V: Cylinder

Equation of a cylinder with a given generator and a given guiding curve - Right circular cylinder - Enveloping cylinder – Enveloping cylinder as a limiting form of an enveloping cone.

Recommended Text

T.K.Manickavachagom Pillay & others. (2004) *Analytical Geometry* (Three Dimensions) S.Viswanathan Printers & Publishers Pvt. Ltd. Chennai.

Reference Books

- 1. P.Duraipandian and LaxmiDuraipandian (1965) *Analytical Geometry-2D*, Asia Publishing company, Bombay
- 2. P.Duraipandian and LaxmiDuriapandian (1975) Analytical Geometry-3 D, Emerald Publishers, Chennai.
- 3. G.B.Thomas and R.L.Finney.(1998) *Calculus and Analytic Geometry*, Addison Wesley (9thEdn.), Mass. (Indian Print).
- 4. P.R.Vittal (2003) Coordinate Geometry. Margham Publishers, Chennai

Course Outcomes

At the end of the course the student will be able to

- [1] know the equation of the plane and its applications
- [2] gain the knowledge of straight line and its applications
- [3] solve sphere related problems
- [4] know the concepts of cone, right circular cone and enveloping cone
- [5] know the concepts related to cylinder.

ALLIED SUBJECTS FOR MATHEMATICS STUDENTS

To choose any two out of the following Four Allied subjects as Allied I and Allied II. Each Allied subject consists of two papers as paper I and Paper II and one Practical paper.

- 1. Mathematical Statistics (Paper I and II)
- 2. Numerical Methods (Paper I and II)
- 3. Physics (Paper I and II)
- 4. Chemistry (Paper I and II)

ALLIED

MATHEMATICAL STATISTICS - I

Objective

To apply Statistics Methods for Mathematical Problems.

UNIT-I

Concept of Sample Space - Events - Definition of Probability (Classical, Statistical and Axiomatic) - Addition and Multiplication laws of Probability -Independence of Events - Conditional Probability - Baye's Theorem - Simple Problems.

UNIT -II

Random Variables (Discrete and Continuous) - Distribution Function -Expectation and Moments - Moment Generating Function - Probability Generating Function - Cumulant Generating Function - Simple Problems.

UNIT-III

Characteristic Function - Properties - Uniqueness and Inversion Theorem (Statement only) Chebychev's Inequality - Simple Problems

UNIT-IV

Concept of Bivariate Distribution - Correlation - Karl Pearson's Coefficient of Correlation - Rank Correlation - Linear Regression.

UNIT-V

Standard distributions: Discrete distributions - Binomial, Poisson, Hyper Geometric and Negative Binomial Distributions - Continuous Distributions Normal, Uniform, Exponential.

Recommanded text book:

S.C. Gupta & V.K. Kapoor : Fundamentals of Mathematical Statistics, Sultan & sons

Books for Reference

- 1. Hogg, R.V. &Craig.A.T.(1998) : Introduction to Mathematical Statistics, Macmillan
- 2. Mood. A.M. Graybill. F.A.&Boes.D.G.(1974) : Introduction to theory of Statistics, McGraw Hill.
- 3. Snedecor.G.W. &Cochran.W.G.(1967) : Statistical Methods, Oxford and IBH
- 4. Hoel, P.G (1971): Introduction to Mathematical Statistics, Wiley.
- 5. Wilks S.S. Elementary Statistical Analysis, Oxford and IBH

ALLIED

MATHEMATICAL STATISTICS II

Objective

To apply Statistics for Mathematical problems

UNIT-I

Statistical Population Census and Sampling Survey - Parameter and Statistics -Sampling and Sampling Distribution and Standard Error. Sampling distributions students 't', chi - square and F distributions.

UNIT-II

Test of significance - Large sample test for proportion, mean and standard deviation - Exact test based on 't', Chi - square and F distribution with respect to population mean, variance and correlation coefficient - Tests of independence of attributes - goodness of fit tests.

UNIT-III

Point estimation - Concept of unbiasedness, consistency, efficiency and sufficiency - Cramer- Rao Inequality - Methods of Estimation - Maximum Likelihood Estimation - Method of Moments.

UNIT-IV

Test of Hypothesis: Null and Alternate Hypothesis - Type I and Type II error -Power of the test - Neymann Pearson lemma - Likelihood Ratio Test - Concept of Most Powerful test (Statement and Results only) - Simple Problems

UNIT-V

Analysis of Variance - One - way and Two-way Classification - Basic Principles of Design of Experiments - Randomization, Replication, Local Control, Completely Randomized Design, Randomized Block Design and Latin Square Design.

Recommended Text:

S.C. Gupta & V.K. Kapoor: Fundamentals of Mathematical Statistics, Sultan & sons **Books for Reference**

- 1. Hogg, R.V. & Craig. A. T. (1998): Introduction to Mathematical Statistics, Macmillan
- 2. Mood.A.M., Graybill. F.A.&Boes. D.G. (1974): Introduction to theory of Statistics, McGraw Hill.
- 3. Snedecor.G.W. &Cochran.W.G.(1967): Statistical Methods, Oxford and IBH
- 4. Hoel.P.G (1971): Introduction to Mathematical Statistics, Wiley.
- 5. Wilks . S. S. Elementary Statistical Analysis, Oxford and IBH

- 6. O. Kempthone Design of Experiments7. Das and Giri : Design of Experiments Wiley Eastern

ALLIED PRACTICAL

MATHEMATICAL STATISTICS

ALLIED PRACTICAL

MATHEMATICAL STATISTICS

- 1. Measures of location and Dispersion (absolute and relative)
- 2. Computation of Correlation Coefficient for raw and Grouped data, Rank Correlation Coefficient
- 3. Computation of Regression Equations for Raw and Grouped Data
- 4. Curve Fitting by the Method of Least Squares
 - a. y=ax+b
 - b. $y=ax^2+bx+c$
 - c. y=ae^{bx}
 - d. y=ax^b
- 5. Fitting of Binomial, Poisson, Normal distributions and tests of goodness of fit.
- 6. Large sample tests with regard to population mean, proportion, standard deviation
- 7. Exact tests with Respect to Mean, Variance and Coefficient of Correlation
- 8. Test for Independence of Attributes Based on Chi-Square Distribution
- 9. Confidence Interval based on Normal, t and Chi-square and F Distributions
- 10. Problems based on ANOVA-one way and two way Classification
- 11. Completely Randomized Design
- 12. Randomized Block Design
- 13. Latin Square Design

Note

Use of scientific calculator shall be permitted for practical examination. Statistical and Mathematical tables are to be provided to the students at the examination hall.

□ Mathematics faculty alone should be appointed as examiners.

Books for Reference

 Hogg, R.V. &Craig.A.T.(1998): Introduction to Mathematical Statistics, Macmillan.
 Mood.A.M. ,Graybill. F.A.&Boes.D.G.(1974) : Introduction to theory of Statistics, McGraw Hill.

- 1. Snedecor.G.W. &Cochran.W.G.(1967): Statistical Methods, Oxford and IBH
- 2. Hoel.P.G (1971): Introduction to Mathematical Statistics, Wiley.
- 3. S.C. Gupta & V.K. Kapoor: Fundamentals of Mathematical Statistics, Sultan &sons
- 4. S.C. Gupta & V.K. Kapoor: Fundamentals of Applied Statistics, Sultan & sons

- 5. Wilks . S. S. Elementary Statistical Analysis, Oxford and IBH
- 6. O. Kempthone Design of Experiments.

ALLIED PAPERS

NUMERICAL METHODS - I

Objectives

This course will cover basic methods for finding the Finite differences, Central differences, Inverse interpolation, Summation of series, Interpolation for equal & unequal intervals, Solutions of simultaneous equations, Important principles, Method and Processes to get numerical results, Reliability of numerical result.

UNIT-I: Finite Differences

First and higher order differences-forward differences and Backward differences-Properties of operators-Differences of a Polynomial-Factorial Polynomials-Operator E, Relation between \blacktriangle , \lor and E–Interpolation - Newton - Gregory forward & backward formulae for interpolation.

UNIT-II: Central Differences

Central difference Operators-Central differences formulae: Gauss Forward and Backward formulae-Sterling's formula-Bessel's formula.

UNIT-III: Interpolation for Unequal Intervals

Divided differences-Newton's divided differences formula and Lagrange's-Estimating the Missing terms (With one or more missing values).

UNIT-IV: Inverse Interpolation

Lagrange's method and Reversion of series method (Using Newton's forward formula only).

Summation of series: Sum to n term of the series whose general term is the first difference of a function-summation by parts.

UNIT-V: Solutions of Simultaneous Linear Equations

Gauss elimination method-matrix inversion method-Gauss-Jordan Method, Gauss-Seidal method (Three unknowns only).

Recommended Text

1. B.D. Gupta.(2001) *Numerical Analysis*.Konark Pub. Ltd., Delhi 2. M.K. Venkataraman. (1992) *Numerical methods for Science and Engineering* National Publishing Company, Chennai.

Reference Books

1. S. Arumugham. (2003) Numerical Methods, New Gamma Publishing, Palamkottai.

2. H.C. Saxena. (1991) Finite differences and Numerical analysis S.Chand & Co.,

Delhi

- A.Singaravelu (2004). *Numerical Methods*Meenakshi Agency, Chennai
 P.Kandasamy, K.Thilagavathy (2003) Calculus of Finite difference & Numerical Analysis, S. Chand & Company Ltd., New Delhi-55.

NUMERICAL METHODS II

Objectives

This course covers the techniques of Numerical Differentiation and Numerical Integration. It also deals with solution of difference equations, Algebraic and Transcendental equations and Numerical solution of Ordinary differential equations of first order.

UNIT-I: Numerical Differentiation

Newton's forward and backward differences to compute derivatives-derivative using divided differences formula-maxima and minima using the above formulae.

UNIT-II: Numerical Integration

General Quadrature formula-Trapezoidal rule-Simpson's one third rule-Simpson's three-eight rule, Weddle's rule- Euler-Maclaurin Summation Formula

UNIT-III: Difference Equations

Linear differences equations-Linear homogeneous difference equation with constant co-efficient-Particular integrals for a^x , x^m , sinax, cosax and a^x f(x).

UNIT-IV: Solution of Algebraic and Transcendental Equations

Bisection method-Iteration method-Regula-falsi method (False Position Method)-Newton-Rapson Method.

UNIT-V: Numerical Solution of Ordinary Differential Equations (First order only)

Euler's method- Euler's modified method-Picard's method - Taylor's methods-Runge-Kutta method (Fourth order only).

Recommended Text

- 1. B.D. Gupta. (2001) Numerical Analysis. Konark Pub. Ltd., Delhi
- 2. M.K.Venkataraman. (1992) *Numerical methods for Science and Engineering* National Publishing Company, Chennai.

Reference Books

- 1. Gupta-Malik, Calculus of finite differences and numerical Analysis, KrishbaPrakashanMandir, Meerut Seveenth Edition.
- 2. S.C.Saxena, Calculus of finite differences and Numerical Analysis, S.Chand& Co., New Delhi. IX Edition.
- 3. A.Singaravelu, Numerical methods, Meenakshi Publications-First Edition 1992.
- 4. P.Kandasamy, K.Thilagavathy (2003) Calculus of Finite Difference & Numerical Analysis, S.Chand& Company Ltd., New Delhi-55.

ALLIED PRACTICAL

NUMERICAL METHODS

LIST OF PROBLEMS

- 1. Derivatives by Newton's method
- 2. Gauss elimination method.
- 3. Gauss-Jacobi method.
- 4. Gauss-Siedel method.
- 5. Newton's forward and backward interpolation.
- 6. Lagrange interpolation.
- 7. Trapezoidal and Simpson one-third rules.
- 8. Euler's method.
- 9. Picard's method
- 10. Runge-Kutta's method.

ALLIED PHYSICS PAPER-1

Course Objectives

- 1. To understand the basics of gravitation and to study the properties of matter.
- 2. To learn the law of thermoelectric circuits and thermoelectric diagrams.
- 3. To teach the growth and decay of a transient current and magnetometer.
- 4. To explain production of ultrasonics and reverberation time.
- 5. To know the basics of laser and fibre optics principles and applications.

UNIT-1: Properties of Matter

Gravitation: Acceleration due to gravity -Determination of 'g' by Simple pendulum -Drawbacks of simple pendulum –Determination of time period of compound pendulum - 'g' by compound pendulum -Centre of Oscillation and Centre of Suspension are interchangeable-Determination of 'g' by Bar/compound pendulum.

Elasticity: Bending of beams -Expression for bending moment - Cantilever Depression at the loaded end of a cantilever Expression forYoung's modulus -non–uniform bending-Pin and microscope method.

Torsion : Torsion couple – Potential energy in a twisted wire – Torsional pendulum – Time period -Determination of rigidity modulus by Torsional oscillation (without masses).

Viscosity: Viscosity of a liquid -Viscous force - Co-efficient of viscosity of a liquid – Poiseuille's formula -Experimental method using Burette- Effect of temperature and pressure on viscosity-applications.

Surface Tension: Surface tension of a liquid-Surface Tension and interfacial surface tension by the method of drops-applications.

UNIT-2: Thermo Electricity

Seeback, Peltier and Thomson effects - laws of thermoelectric circuits -Peltier coefficient -Thomson coefficient -application of thermodynamics to a thermocouple and expressions for Peltier and Thomson coefficients -thermo electric power and thermo electric diagrams.

UNIT-3: Transient Current and Magnetism

Growth and decay of current in a circuit containing resistance and inductance- Growth and decay of charge in circuit containing resistance and capacitor - growth and decay of charge in a LCR circuit – condition for the discharge to be oscillatory – frequency of oscillation.
UNIT -4: Acoustics

Sound: Transverse vibration of strings -Velocity and frequency of vibrations of a stretched string -laws -Sonometer -A.C. Frequency - Steel wire- Brass wire.

Introduction to Ultrasonics – Piezo electric effect–production by Piezo electric method – properties –applications- Acoustics of buildings – reverberation time – derivation of Sabine's formula – determination of absorption coefficient-Acoustic aspects of halls and auditoria.

UNIT-5:Lasers and Fibre Optics

Laser: Introduction - Principles of laser -Einstein's explanation for stimulatedemission – Differences between stimulated and spontaneous emission - Population inversion –Properties of laser -Types of lasers - He- Ne Laser - Semiconductor Laser-Applications of laser.

Fibre optics: Basic principle of an optical fibre -Total internal reflection -Basic structure of an optical fibre -Numerical aperture –Coherent bundle – Attenuation and dispersion - classification of optical fibres-step index and graded index fibers – single mode and multi mode fibers-Fibre optic communication system block diagram.-applications.

Text Books

Unit 1 and Unit 4

1. R. Murugesan and KiruthigaSivaprasath, Properties of Matter and Acoustics, S. Chand & Co. New Delhi, Kindle edition.

Unit 2 and Unit 3

1. R. Murugesan, Electricity & Magnetism, S. Chand & Co. New Delhi, 2019.

Unit 5

1. N Subrahmanyam, BrijLal and M.N Avadhanulu, A Text Book of Optics, S. Chand &Co. New Delhi, Revised Edition as per UGC model syllabus.

Reference Books

- 1. BrijLal and N Subrahmanyam, Electricity and Magnetism, S Chand & Company Pvt Ltd, New Delhi, 2000.
- 2. D.C. Tayal, Electricity and Magnetism, Himalaya Publishing House, Bombay, 2014.
- 3. BrijLal and N.Subrahmanyam, A Text Book of Sound, Vikas Publications, New Delhi (2 Edition)
- 4. C.L.Arora, Physics for Degree Students B.Sc First Year, S. Chand Publishing, 2013.
- 5. K.Thyagarajan and Ajay Ghatak, Introduction to Fibre optics-, Cambridge University.

- Ajay Ghatak and K.Thyagarajan, Fiber optics and Lasers-The two revolutions, Macmillan, 2006.
- K.Thyagarajan and Ajay Ghatak, Lasers; Fundamentals and applications, Springer.
- 8. Modern Physics R, Murugeshan, KiruthigaSivaprasath, S.Chand&Co, New Delhi, 2016.

E-MATERIALS

- 1. <u>https://courses.lumenlearning.com/physics/chapter/16-4-the-simple-pendulum/</u>
- 2. <u>https://www.youtube.com/watch?v=aw0_seEt4v0</u>
- 3. https://en.wikipedia.org/wiki/Thermoelectric_effect
- 4. <u>https://www.youtube.com/watch?v=S0I37M2sx_0</u>
- 5. https://physicscatalyst.com/elecmagnetism/growth-and-delay-charge-R-C-circuit.php
- 6. <u>https://www.youtube.com/watch?v=PLQQPXot6vE</u>
- 7. <u>https://www.youtube.com/watch?v=d0_Eff4MXwM</u>
- 8. <u>https://www.techglads.com/cse/sem1/production-of-ultrasonics-by-piezoelectric-methods/</u>
- 9. https://thefactfactor.com/facts/pure_science/physics/optical-fibre/5159/
- 10. <u>https://www.youtube.com/watch?v=auk1OS0SVWc</u> (Tamil video)

Course Objectives

- 1. After studied unit-1, the student will be able to find the acceleration due to gravity at a place using simple pendulum and compound pendulum. Also can know the properties of matter like elasticity, viscosity and surface tension.
- 2. After studied unit-2, the student will be able to learn thermo emf using Seebeck and Peltier effects and hence understand thermoelectric circuits.
- 3. After studied unit-3, the student will be able to explain growth and decay of a transient current in a circuit containing resistance-inductance, resistance-capacitance and LCR in series. Also will be able to determine the horizontal components of earth's magnetic induction at a place using deflection magnetometer in Tan C position.
- 4. After studied unit-4, the student will be able to derive the expression for the velocity of a sound in a stretched string and hence they can determine the frequency of A.C mains.
- 5. After studied unit-5, the student will be able to understanding the principle of laser and can demonstrate the working of He-Ne laser and applications of laser. Also, the student will be able to learn the fibre optics, structure and application in communication.

ALLIED PHYSICS PAPER-2

Course Objectives

- 1. To study the concept of special theory of relativity.
- 2. To expose the structure of atom with different models.
- 3. To know the definition of binding energy and to study about nuclear models
- 4. To learn the different number system in digital electronics and logic gates
- 5. To give an introduction about nanomaterial.

UNIT-1: Special Theory of Relativity

Frames of reference-inertial frames and non-inertial frames -Galilean transformations -Michelson-Morley experiment-interpretation of results - postulates of special theory of relativity Lorentz transformation equations -length contraction - time dilation transformation of velocities -variation of mass with velocity -Mass-energy equation.

UNIT-2: Atomic Physics

Bohr atom model – Critical Potentials - Experimental determination of critical potentials -Franck and Hertz's experiment -Sommerfield's Relativistic atom model The vector atom model – spatial quantization–spinning of an electron –quantum numbers associated with the vector atom model – coupling schemes –LS and jj coupling – the Pauli's exclusion principle – Stern and Gerlach experiment

UNIT-3: Nuclear Physics

Binding energy-Binding energy per nucleon-Packing fraction-Nuclear models – liquid drop model – semi empirical mass formula – merits and demerits -shell model -evidences for shell model – nuclear radiation detectors –ionization chamber – G.M Counter-Wilson cloud chamber-Particle accelerators-Cyclotron-Betatron.

Unit-4: Digital Electronics

Number systems -Decimal, Binary, Octal and Hexadecimal system – Conversion from one number system to another- Binary Arithmetic -Addition –Subtraction- 1's and 2's complement -Binary codes- BCD code – Excess 3 code, Gray code.

NAND, NOR and EXOR – functions and truth tables. NAND & NOR as universal gates-Half adder and Full adder - Half subtractor and Full subtractor using NAND gate only.

UNIT-5: Nanomaterial

Introduction-Nanomaterial- Properties of nanomaterial (size dependent) -synthesis of nanomaterial- sol gel- hydrothermal method-Scanning Electron Microscope (SEM)- Principle and Instrumentation-Fullerenes- Carbon nanotubes- Fabrication and structure of carbon nanotubes - Properties of carbon nanotubes (Mechanical and Electrical) - Applications of CNT's.

Text Books

Unit 1 to Unit 3

Modern Physics – R, Murugeshan, KiruthigaSivaprasath, S.Chand&Co, New Delhi, 2016

Unit 4

1. V.Vijayendran, Introduction to Integrated Electronics (Digital & Analog), S. Viswanathan, Printers & Publishers Private Ltd, Chennai, 2007

Unit 5

1. V. Raghavan, Material Science and Engineering , Printice Hall India., 2004.

Reference Book

- 1. Allied Physics R. Murugesan S. Chand & Co. New Delhi, 2005.
- 2. A Text book of Digital electronics R.S.Sedha, S.Chand&Co, 2013
- 3. Malvino and Leech, Digital Principles and Application, 4th Edition, Tata McGraw

Hill, New Delhi, 2000.

- 4. Dr. M.N. Avadhanulu, Material science, S.Chand& Company, New Delhi, 2014.
- 5. M.Arumugam, Material science, Anuradhapuplishers, 1990.
- 6. V. Rajendran, Material Science, Tata McGraw Hill Ltd, New Delhi, 2001.
- 7. D.C.Tayal, Nuclear Physics, Himalaya Publishing House, 2009

E-MATERIALS

- 1. <u>https://en.wikipedia.org/wiki/Galilean_transformation</u>
- 2. <u>https://www.youtube.com/watch?v=NH3_lIkSB9s</u>
- 3. <u>https://www.youtube.com/watch?v=EEWuUst2GK4</u>
- 4. <u>https://en.wikipedia.org/wiki/Vector_model_of_the_atom</u>
- 5. <u>https://www.tutorialspoint.com/what-is-a-geiger-muller-counter</u>
- 6. <u>https://www.youtube.com/watch?v=jxY6RC52Cf0</u>
- 7. <u>https://www.tutorialspoint.com/digital_circuits/digital_circuits_number_systems.htm</u>
- 8. <u>https://www.youtube.com/watch?v=4ae9sJBBkvw</u>
- 9. <u>https://en.wikipedia.org/wiki/Nanomaterials</u>
- 10. <u>https://www.youtube.com/watch?v=mPxoJz6treE</u> (Tamil video)

Course Outcomes

- 1. After studied unit-1, the student will be able to study the frames of reference, Galilean transformation equations and special theory of relativity.
- 2. After studied unit-2, the student will be able to describe the different atomic models and Stern and Gerlach Experiment.
- 3. After studied unit-3, the student will be able to explain binding energy, liquid drop model, G.M counter and particle accelerators.
- 4. After studied unit-4, the student will be able to know the conversion of number systems from one to other and also will be able to design universal gates using NAND and NOR gates.
- 5. After studied unit-5, the student will be able to understanding the basics of nanomaterial, synthesis and its applications.

ALLIED PRACTICAL- PHYSICS

ALLIED PRACTICAL- PHYSICS

List of Experiments (Any 12 Experiments only)

- 1. Determination of 'g' using Compound pendulum.
- 2. Young's modulus-Non-Uniform bending-Pin & microscope
- 3. Rigidity Modulus Torsional oscillation method (without masses).
- 4. Rigidity Modulus Static Torsion method using Scale and Telescope.
- 5. Surface tension and Interfacial Surface tension by Drop Weight method.
- 6. Sonometer Frequency of a Tuning fork.
- 7. Sonometer –Determination of A.C. frequency- using steel and brass wire
- 8. Air Wedge Determination of thickness of a thin wire
- 9. Newton's Rings Radius of Curvature of a convex lens.
- 10. Spectrometer Refractive index of a liquid Hollow prism.
- 11. Spectrometer grating Minimum Deviation- Wavelength of Mercury lines.
- 12. Potentiometer Calibration of Low range voltmeter.
- 13. Deflection magnetometer and Vibration magnetometer-Tan C Position-Determination of

m and B_{H} .

- 14. Figure of merit- Table galvanometer.
- 15. Construction of AND, OR gates using diodes and NOT gate using a transistor.
- 16. NAND/NOR as universal gate.
- 17. Half adder and Full adder using NAND gate.
- 18. Half subtractor and Full subtractor using NAND gate.
- 19. Lasers: Study of laser beam parameters.
- 20. Measurement of Numerical aperture (NA) of a telecommunication graded index optic fiber.
- 21. Fiber attenuation of a given optical fiber.

Text Books

- 1. C.C. Ouseph, U.J. Rao, V. Vijayendran, Practical Physics and Electronics, S. Viswanathan, Printers & Publishers Private Ltd, Chennai, 2018.
- 2. M.N.Srinivasan, S. Balasubramanian, R.Ranganathan, A Text Book of Practical Physics, Sultan Chand & Sons, New Delhi, 2015.

Reference Books

- 1. Dr. S. Somasundaram, Practical Physics, Apsarapublications, Tiruchirapalli, 2012.
- 2. R. Sasikumar, Practical Physics, PHI Learning Pvt. Ltd, New Delhi, 2011.

ALLIED

PAPER – 1

CHEMISTRY – I

OBJECTIVE:

 Basic knowledge on Metallurgy, Cycloalkanes, Polarising Effects, Stereochemistry, Chemical Kinetics, Catalysis, Photochemistry, VSEPR Theory, Fuels, Osmosis, Nuclear Chemistry, Petroleum Chemistry, Chemistry of Naphthalene, Conductors and Applications wherever necessary are to be taught for I- Semester.

UNIT – I

1.1General Metallurgy - Extraction of Metals - Minerals and Ores- Difference between Minerals and Ores – Minerals of Iron, Aluminum and Copper - Ore Dressing or Concentration of Ores - Types of Ore Dressing- Froth Floatation process, Gravity separation and Magnetic separation.

1.2 Calcination, Smelting, Roasting, Fux, Slag - Definition - Reduction methods -Goldschmidt Aluminothermic process and Carbon Reduction method - Refining of Metals - Electrolytic, Van Arkel and Zone Refining.

1.3 Ores of Titanium and Cobalt - Extraction of Titanium and Cobalt.

UNIT – II

 Cycloalkanes - Preparation – Wurtz reaction and Dieckmann's condensation -Properties of Cycloalkanes – Substitution and Ring opening reactions.

2.2 Polarisation - Inductive effect, Mesomeric effect and Steric effect (Acid and Base Strength).

2.3Stereoisomerism – Types - Cause of Optical Activity – Enantiomers -Diastereomers - Meso form - Optical Activity of Lactic acid and Tartaric acid -Racemisation and Resolution – Definition and Methods - Geometrical isomerism – Definition and example - Maleic and Fumaric acid – Differences.

UNIT – III

3.1 Chemical Kinetics – Rate of a reaction – Definition of Order and Molecularity – Distinction between Order and Molecularity - Derivation of First order rate equation
- Half Life Period of first order reaction.

3.2 Catalysis - Catalyst - Autocatalyst - Enzyme catalyst - Promoters - Catalytic poisons –

Active Centre - Differences between Homogeneous and Heterogeneous Catalysis -Industrial Applications of Catalysts.

3.3 Photochemistry – Grothus-Draper's law – Stark-Einstein's law - Quantum yield – Photosynthesis - Phosphorescence – Fluorescence.

UNIT – IV

4.1 VSEPR Theory – Hybridisation and Shapes of simple molecules BF_3 , PCl_5 , SF_6 and XeF_6 .

4.2 Fuels – Classification of Fuels - Calorific value of Fuels – Water gas, Carbureted Water gas and Producer gas – Composition and Uses - Non-Conventional fuels - Need of Solar Energy - Applications - Biofuels – Oil gas, Natural gas and LPG – Uses.

4.3 Osmosis - Osmotic pressure - Reverse osmosis – Definition - Desalination of Sea water.

 $\mathbf{UNIT} - \mathbf{V}$

5.1Nuclear Chemistry – Atomic number, Mass number - Isotopes, Isobars and Isotones – Definition and Examples - Definition of Half life period - Nuclear Binding Energy, Mass Defect and N/P ratio - Nuclear Fission and Nuclear Fusion (Elementary idea) - Applications of Radioisotopes in Medicine, Agriculture and Industries – Carbon Dating.

5.2 Crude Oil - Petroleum - Petroleum Refining - Cracking - Applications of Cracking -

Naphthalene – Preparation – Haworth's method – Properties – Oxidation, Reduction and Uses of Naphthalene - Structure of Naphthalene (Structural elucidation not necessary).

5.3 Conductors, Insulators, Semiconductors, N- and P- Type Semiconductors – Definitions and Examples.

ALLIED PAPER – 2 CHEMISTRY – II

OBJECTIVE:

 Basic knowledge on Coordination Chemistry, Industrial Chemistry, Carbohydrates, Aminoacids, Proteins, Electrochemistry, Paints and Pigments, dyes, Vitamins, Medicinal Chemistry, Corrosion and Applications wherever necessary are to be taught for II- semester.

UNIT - I

1.1 Coordination Chemistry - Nomenclature of Coordination Compounds - Ligands, Central Metal Ion and Complex Ion – Definition and Examples – Coordination Number - Werner's Theory of Coordination Compounds - Chelates - Functions and Structure of Haemoglobin and Chlorophyll.

1.2 Industrial Chemistry - Fertilisers and Manures – Biofertilisers - Organic Manures and their importance - Role of NPK in plants - Preparation and Uses of Urea, Ammonium Nitrate, Potassium Nitrite and Super Phosphate of Lime.

1.3 Contents in Match Sticks and Match Box - Industrial making of Safety Matches – Preparation and Uses of Chloroform, DDT, Gammexane and Freons.

UNIT – II

2.1 Carbohydrates - Definition and Examples - Classification – Oxidation and Reduction Reactions of Glucose - Structure of Glucose (Structural elucidation not necessary) - Uses of Starch - Uses of Cellulose Nitrate and Cellulose Acetate.

2.2 Amino Acids - Definition and Examples - Classification of Amino Acids -

Preparation - Gabriel Phthalimide Synthesis – Properties – zwitterion and Isoelectric point - Structure of Glycine.

2.3 Proteins – Definition - Classification of Proteins based on Physical properties and Biologcal functions - Primary and Secondary Structure of Proteins (Elementary Treatment only) – Composition of RNA and DNA and their Biological role - Tanning of Leather - Alum (Aluminum chloride tanning) - Vegetable tanning – Chrome Tanning.

UNIT – III

3.1 Electrochemistry - Electrolytes – Definition and Examples – Classification -Specific and Equivalent Conductance - their determination – Variation of Specific and Equivalent conductance with Dilution – Ostwald's Dilution Law and its Limitations.

3.2 Kohlrausch's Law - Determination of Dissociation Constant of weak Electrolytes using Conductance measurement - Conductometric titrations.

3.3 pH – Definition and pH determination by indicator method - Buffer solutions -Buffer action - Importance of buffers in the living systems.

UNIT - IV

4.1Paints - Components of Paint – Requisites of a Good Paint - Pigments – Classification of Pigments on the basis of Colour – Examples - Dyes – Definition – Chromophores and Auxochromes – Examples - Colour and Dyes - Classification based on Constitution and Application – Examples.

4.2 Vitamins - Definition - Classification - Water Soluble and Fat Soluble -

Occurrence - Biological Activities and Deficiency Diseases caused by Vitamin A, B, C, D, E and K - Hormones – Definition and Examples – Biological Functions of Insulin and Adrenaline.

4.3 Chromatography - Principles and Applications of Column and Paper chromatography- R_f value.

$\mathbf{UNIT}-\mathbf{V}$

5.1 Drugs - Sulpha Drugs – Preparation and Uses of Sulphapyridine and
Sulphadiazine - Mode of Action of Sulpha Drugs - Antibiotics - Uses of Penicillin,
Chloramphenicol and Streptomycin - Drug Abuse and Their Implication - Alcohol –
LSD.

5.2 Anaesthetics - General and Local Anaesthetics - Antiseptics - Examples and their Applications - Definition and One Example each for Analgesics, Antipyretics, Tranquilizers, Sedatives - Causes, Symptoms and Treatment of Diabetes, Cancer and AIDS.

5.3 Electrochemical Corrosion and its Prevention – Electroplating – Applications.

ALLIED PRACTICAL CHEMISTRY

VOLUMETRIC ANALYSIS

- 1. Estimation of HCl Standard sulphuric acid.
- 2. Estimation of Borax Standard Sodium Carbonate.
- 3. Estimation of NaOH Standard Oxalic Acid.
- 4. Estimation of FeSO₄ Standard FAS.
- 5. Estimation of Oxalic acid Standard FeSO₄.
- 6. Estimation of FAS Standard Oxalic Acid.
- 7. Estimation of Oxalic acid Standard Oxalic Acid.
- 8. Estimation of Fe^{2+} using Diphenylamine / N- Phenyl Anthranilic acid as indicator.

ORGANIC ANALYSIS

Systematic Analysis of Organic Compounds containing One Functional Group and Characterisation by Confirmatory Tests.

Reactions of Aromatic Aldehyde, Carbohydrates, Mono and Dicarboxylic acids,

Phenol, Aromatic Primary Amine, Amide and Diamide.

REFERENCE BOOKS

- ♦ Inorganic Chemistry P. L. Soni Sultan Chand (2006).
- Inorganic Chemistry B. R.. Puri, L. R. Sharma and K. C. Kallia Milestone Publications (2013).
- Selected Topics in Inorganic Chemistry W. U. Malik, G. D. Tuli and R. D. Madan S. Chand Publications (2008).
- ★ Text Book of Inorganic Chemistry R. Gopalan, Universities Press 2012.
- ◆ Text Book of Organic Chemistry P. L. Soni Sultan Chand & Sons 2007.
- Advanced Organic Chemistry Bahl and Arun Bahl Sultan Chand and Co. Ltd 2012.

- ♦ Organic Reaction Mechanisms Gurdeep Chatwal- Himalaya Publishing House.
- ✤ A Text Book of Organic Chemistry K. S. Tewari, N. K. Vishol, S. N. Mehrotra-Vikas Publishing House 2011.
- Principles of Physical Chemistry B. R. Puri, Sharma and Madan S. Pathania, Vishal Publishing Company – 2013.
- Text Book of Physical Chemistry P. L. Soni, O. P. Dharmarha and U. N. Dash -Sultan Chand & Co – 2006.
- ♦ Understanding Chemistry C. N. R. Rao, Universities Press 2011.

MASTER OF SCIENCE

M.Sc. Mathematics

DEGREE COURSE

UNDER CBCS

(2021-2022)

The Course of Study and the Scheme of Examination

SI.	Study Components Course Title		ins.			Maximum Marks		
No.			nrs / week	hrs / Credit Title of the Paper week		CLA	Uni.	
	SEMESTER I				CIA	Exam	lotal	
1		Paper -1	6	5	Algebra-I	25	75	100
2	Core	Paper -2	6	5	Real Analysis –I	25	75	100
3		Paper -3	6	4	Ordinary Differential Equations	25	75	100
		Int	ernal Electi	ve for sai	me major students (Choose any one)			
4	Core Elective	Paper-1	6	3	A.Probability Theory B. Mechanics C. Graph Theory	25	75	100
		External E	lective for o	other maj	or students (Inter/multi disciplinary papers))		
5	Open Elective	Paper-1	6	3	A.Basic Mathematics B.Mathematical Foundations C.Mathematical Modeling	25	75	100
			30	20	¥			
				I		I		
SEMESTER II				CIA	Uni. Exam	Total		
6	Core	Paper-4	6	5	Algebra-II	25	75	100
7		Paper-5	6	5	Real Analysis –II	25	75	100
8		Paper-6	6	4	Partial Differential Equations	25	75	100
		Int	ernal Electi	ve for sai	me major students (Choose any one)			
9	Core Elective	Paper-2	5	3	A.Mathematical Statistics B. Fuzzy Set Theory C. Difference Equations	25	75	100
External Elective for other major students (Inter/multi disciplinary papers)								
10	Open Elective	Paper-2	5	3	A.Fundamentals of Insurance B.Numerical Methods C. Fundamentals of Business Statistics	25	75	100
11	*Field Study		-	2		100	-	100
12	12 Compulsory Paper		2	2	Human Rights & Duties	25	75	100
			30	24				

* Field Study

There will be field study which is compulsory in the first semester of all PG courses with 2 credits. This field study should be related to the subject concerned with social impact. Field and Topic should be registered by the students in the first semester of their study along with the name of a mentor before the end of the month of August. The report with problem identification and proposed solution should be written in not less than 25 pages in a standard format and it should be submitted at the end of second semester. The period for undergoing the field study is 30 hours beyond the instructional hours of the respective programme. Students shall consult their mentors within campus and experts outside the campus for selecting the field and topic of the field study. The following members may be nominated for confirming the topic and evaluating the field study report.

(i). Head of the respective department

(ii). Mentor

(iii). One faculty from other department

ANNAMALAI UNIVERSITY MASTER OF SCIENCE M.Sc. MATHEMATICS **DEGREE COURSE Syllabus UNDER CBCS**

(2021 - 2022)

Name of the Course	: Algebra-1	Credits	: 5
Paper type	: Core	Hours of teaching	: 90 hrs

Course Objectives

The objectives of the course is to

- study and develop the concepts group action
- learn the importance of Sylow's theorems and its applications
- introducing structure theorem on abelian groups and studying its application
- learn the basic concepts and ideas of modules and its properties
- understand various canonical forms of transformations
- learn about the properties of matrix of transformations.

UNIT-1: Group Theory

Another counting principle - class equation for finite groups and its applications - Sylow's theorems (For theorem 2.12.1, Only First proof) (Chapter 2: Sections 2.11 and 2.12)

UNIT-2: Group Theory (Continuation)

Direct products - Finite abelian groups (Chapter 2: Sections 2.13 and 2.14 (Only Theorem 2.14.1)

UNIT-3:Ring Theory

Polynomial Rings – Polynomials over the Rational Field (Chapter 3: Sections 3.9 to 3.10)

UNIT-4: Modules and Linear Transformations

Modules -LinearTransformations: Nilpotent transformations - Jordan form - rational canonical form. (Chapter 4: Section 4.5, Chapter 6: Sections 6.5 to 6.7)

UNIT-5: Linear Transformations

Hermitian, unitary, normal transformations, real quadratic form.

18 hours

18 hours

18 hours

18 hours

(Chapter 6: Sections 6.10 and 6.11) **Prescribed Book**

I.N. Herstein, Topics in Algebra, 2nd Edition. Wiley.1975

Reference Books

- 1. D.S.Dummit and R.M.Foote. Abstract Algebra. Wiley 2003
- 2. M. Artin, Algebra, Prentice Hall of India, 1991
- 3. J.A. Gallian. Contemporary Abstract Algebra. 4th Edition. Narosa Publishing 2011
- 4. P.B.Battacharya, S.K.Jain, and S.R.Nagpaul, Basic Abstract Algebra(II Edition) Cambridge University Press, 1997.(Indian Edition)
- 5. I.S. Luther and I.B.S.Passi, Algebra, Vol.I Groups(1996), Vol. II Rings, Narosa Publishing House, New Delhi, 1999.
- 6. L. Smith, Linear transformation: Example and Applications. In: Linear Algebra, Undergraduate texts in Mathematics, Springer, New york. NY, 1998.

E- Materials

- 1. https://nptel.ac.in/courses/111108098/
- 2. <u>https://ocw.mit.edu/courses/Lecture-notes/</u>
- 3. <u>https://mathdoctorbob.org/Algebra.html/</u>

Course Learning Outcomes

- demonstrate ability to think group actions critically by Cayley's theorem and apply the Sylow's theorems to describe the structure of certain finite abelian groups
- know the internal and external direct product of groups. Also, apply the structure theorem on abelian groups to find the non-isomorphic abelian groups of certain orders.
- check the irreducibility of a given polynomial
- know about module and difference between the algebraic structures, Group, Ring and Module.
- know the Linear transformation in canonical forms. Also, the matrix form of linear transformation and its properties.

The objectives of the course is to

- work comfortably with functions of bounded variation
- study the Riemann StieltjesIntegration
- study the convergence of infinite series, infinite product and uniform convergence and its interplay between various limiting operations.

UNIT-1: Functions of Bounded Variation

Introduction - Properties of monotonic functions - Functions of bounded variation - Total variation - Additive property of total variation - Total variation on [a, x] as a function of x -Functions of bounded variation expressed as the difference of two increasing functions -Continuous functions of bounded variation. (Chapter - 6 : Sections 6.1 to 6.8)

UNIT-2: The Riemann - Stieltjes Integral

Introduction - Notation - The definition of the Riemann - Stieltjes integral - Linear Properties - Integration by parts- Change of variable in a Riemann - Stieltjes integral -Reduction to a Riemann Integral - Euler's summation formula - Monotonically increasing integrators, Upper and lower integrals - Additive and linearity properties of upper and lower integrals - Riemann's condition. (Chapter - 7 : Sections 7.1 to 7.13)

UNIT-3: The Riemann-Stieltjes Integral

Integrators of bounded variation-Sufficient conditions for the existence of Riemann Stieltjes integrals-Necessary conditions for the existence of Riemann-Stieltjes integrals Mean value theorems for Riemann - Stieltjes integrals - The integrals as a function of the interval -Second fundamental theorem of integral calculus-Change of variable in a Riemann integral-Second Mean Value Theorem for Riemann integral-Riemann-Stieltjes integrals depending on a parameter-Differentiation under the integral sign. (Chapter - 7: 7.15 to 7.24)

UNIT-4: Infinite Series and Infinite Products

Absolute and conditional convergence - Dirichlet's test and Abel's test - Rearrangement of series - Riemann's theorem on conditionally convergent series. Double sequences - Double series - Rearrangement theorem for double series - A sufficient condition for equality of iterated series - Multiplication of series - Cesarosummability - Infinite products.

(Chapter 8: Sections 8.8, 8.15, 8.17, 8.18, 8.20, 8.21 to 8.26)

UNIT-5: Sequence of Functions

18 hours

Semester: I

Credits: 5 Hours of teaching: 90hrs

18 hours

18 hours

18 hours

Pointwise convergence of sequences of functions - Examples of sequences of real - valued functions - Definition of uniform convergence - Uniform convergence and continuity - The Cauchy condition for uniform convergence - Uniform convergence of infinite series of functions - Uniform convergence and Riemann - Stieltjes integration - Uniform convergence and differentiation - Sufficient condition for uniform convergence of a series - Mean convergence.(Chapter - 9 Sec 9.1 to 9.6, 9.8, 9.10,9.11, 9.13)

Prescribed Book

Tom M. Apostol : Mathematical Analysis, 2nd Edition, Addison-Wesley Publishing Company Inc. New York, (1997).

Reference Books

- 1. R. G. Bartle, Real Analysis, (1976), John Wiley and sons Inc.
- 2. W. Rudin, Principle of Mathematical Analysis (1976), McGraw Hill Company, New York.
- S. C. Malik and SavitaArora, Mathematical Analysis (1991), Wiley Eastern Limited. New Delhi.
- Sanjay Arora and BansiLal, Introduction to Real Analysis (1991), SatyaPrakashan, New Delhi.
- 5. A.L. Gupta and N. R. Gupta, Principle of Real Analysis (2003), Pearson Education.

E-Materials

https://ocw.mit.edu/courses/mathematics/18-100a-introduction-to-analysis-fall-2012/

Course Learning Outcomes

- understand the concept of functions of bounded variation.
- Discuss the Riemann integration and to solve its related problems.
- Analyse the sequences and series of function and their limits
- Acquire the knowledge of Infinite Series and Infinite products
- have knowledge of uniform convergence of sequence and series

Name of the Programme: M.Sc. Mathematics Semester: I

Name of the Course: Ordinary Differential Equations

Paper type: Core

Course Objectives

The objectives of the course is to

- familiarize students to understand the theory and methods of Ordinary Differential Equations(ODEs).
- prepare students to apply and solve ODEs applications from various emerging technologies.
- introduce the concepts and solving methods of Second and nthorder linear differential equations.
- introduce the concepts and solving methods of differential equations with variable coefficients and regular singular point.
- examine the existence and uniqueness of solutions of differential equations.

UNIT-1: Linear Equations with Constant Coefficients

Second order homogeneous equations - Initial value problems for second order - Linear dependence and independence - A formula for the Wronskian -The non - homogeneous equation of order two. (Chapter -2: sections 1 to 6)

UNIT-2: Linear Equations with Constant Coefficients(Continuation) 18 hours

Homogeneous equations of order n - Initial value problems for order n - equations with real constants - Non-homogeneous equations of order n - Annihilator method - Algebra of constant coefficient operators. (Chapter - 2: sections 7 to 12)

UNIT-3: Linear Equations with Variable Coefficients 18 hours

Initial value problems - Existence and Uniqueness theorems - Solutions to solve a nonhomogeneous equation – The Wronskian and linear independence - Reduction of the order of homogeneous equations - Homogeneous equation with analytic coefficients - The Legendre- Equation. (Chapter - 3: Sections 1 to 8)

UNIT-4: Linear Equations with Regular Singular Points 18 hours

Euler equation - Second order equations with regular singular points - general and exceptional cases - Bessel equation. (Chapter - 4 : Sections 1 to 4 and 6 to 8)

UNIT-5: Existence and Uniqueness of Solutions to First Order Equations 18 hours Equation with variables separated - Exact equations - The method of successive approximations - The Lipschitz condition - Convergence of the successive approximations. (Chapter - 5: Sections 1 to 6)

Credits: 4 Hours of teaching: 90hrs

Prescribed Book

Earl A.Coddington, An introduction to ordinary differential equations (Indian Reprint), Prentice- Hall of India Ltd., New Delhi, 2009.

Reference Books

- 1. Williams E. Boyce and Richard C. DI Prima, Elementary differential equations and boundary value problems, John Wiley and sons, New York, 1967.
- 2. George F Simmons, Differential equations with applications and historical notes, Tata McGraw Hill, New Delhi,1974.
- 3. W.T.Reid, Ordinary differential equations, John Wiley and sons, New York, 1971.
- 4. M.D.Raisinghania, Advanced differential equations, S.Chand& Company Ltd. New Delhi,2001.
- 5. N.N.Lebedev,Specialfunctionsandtheirapplications,PrenticeHallofIndia, New Delhi,1965.

E-Materials:

- 1. <u>https://www.coursera.org/learn/ordinary-differential-equations</u>
- 2. <u>https://ocw.mit.edu/courses/mathematics/18-03-differential-equations-spring-2010/</u>
- 3. <u>https://nptel.ac.in/courses/111108081/</u>
- 4. <u>https://ocw.mit.edu/courses/mathematics/18-034-honors-differential-equations-spring-2009/syllabus/</u>

Course Learning Outcomes

- solve Second order linear differential equations.
- solve nthorder differentialequations.
- solve differential equations with variablecoefficients.
- solve differential equations with regular singularpoints.
- examine the existence and uniqueness of solutions of differential equations.
- apply ODE problems for real timeapplications.

Name of the Programme : M.Sc. MathematicsSemester: IName of the Course : Probability TheoryCredits: 3Paper Type: Internal ElectiveHours of Teaching : 90 hrs------

Course Objectives:

The objectives of the course is to

- introduce the basic notions of experiments, events, probability, random variables and probability distributions.
- give an insight about the various parameters and measures of the probability distributions.
- educate the characteristic functions and its properties.
- inculcate the special types of discrete and continuous probability distributions.
- indoctrinate the strong theoretical background about the limit theorems and its consequences.

Unit-1: Probability and Random Variables

Random Experiments – Sample Space – Random Events – Probability Axioms – Conditional Probability – Mutual Exclusive Events – Independent Events – Addition and Product Theorems on Probability – Theorem of Total Probability – Baye's Theorem – Random Variables – Probability Mass and Density Functions – Distribution Function – Joint Distribution – Marginal Distribution – Conditional Distribution – Independent Random Variables – Functions of Random Variables. (Chapter 1 – Sections: 1.1–1.7 and Chapter 2 – Sections: 2.1–2.9)

Unit-2: Parameters of the Distribution

Mathematical Expectation – Moments – The Chebyshev Inequality – Absolute Moments – Order Parameters – Moments of Random Vectors – Regression of the First and Second Types. (Chapter 3 – Sections: 3.1–3.8)

Unit-3: Characteristic Functions

Properties of Characteristic Functions – Characteristic Functions and Moments – Semi-Invariants – Characteristic Function of the Sum of the Independent Random Variables – Determination of Distribution Function by the Characteristic Function – Characteristic Function of Multidimensional Random Vectors – Probability Generating Functions. (Chapter 4 – Sections: 4.1–4.7)

Unit-4: Speical Probability Distributions

Discrete Probability Distributions: One Point – Two Point – Bernoulli Trails – Binomial – Poisson – Polya – Hypergeometric Distributions – Continuous Probability Distributions: Uniform – Normal – Gamma – Beta – Cauchy – Laplace Distributions. (Chapter 5 – Sections: 5.1–5.10)

18 Hours

18 Hours

18 Hours

18 Hours

Unit-5: Limit Theorems

18 Hours

Stochastic Convergence – Bernoulli Law of Large Numbers – Convergence of Sequence of Distribution Functions – Levy-Cramer Theorems – The deMoivre-Laplace Theorem –

 $The\ Lindeberg-Levy\ Theorem-LapunovTheroem.$

(Chapter 6 – Sections: 6.1–6.4 and 6.6–6.9)

Prescribed Book

M. Fisz, *Probability Theory and Mathematical Statistics*, 3rd Edition, John Wiley and Sons Inc., New York, 1963.

Reference Books:

- 1. R.B. Ash, Real Analysis and Probability, Academic Press, New York, 1972.
- 2. K.L. Chung, *A Course in Probability*, 2nd Edition, Academic Press, New York, 1974.
- 3. R. Durrett, *Probability: Theory and Examples*, 5th Edition, Cambridge University Press, New York, 2019.
- 4. V.K. Rohatgi and A.K.Md.E. Saleh, *An Introduction to Probability Theory and Mathematical Statistics*, 2nd Edition, Wiley Eastern Ltd., New Delhi, 1988.
- 5. B.R. Bhat, *Modern Probability Theory An Introductory Textbook*, 4th Edition, New Age International Pvt. Ltd., New Delhi, 2014.

E-Materials:

- 1. https://ocw.mit.edu/resources/res-6-012-introduction-to-probability-spring-2018/
- 2. <u>https://www.coursera.org/learn/introductiontoprobability</u>
- 3. <u>https://swayam.gov.in/nd1_noc20_ma18/preview</u>

Course Learning Outcomes

- know the basic notions of experiments, events, probability, random variables and probability distributions.
- comprehend the various parameters and measures of the probability distributions.
- understand the characteristic functions and its properties.
- acquire the special types of discrete and continuous probability distributions.
- procure the strong theoretical background about the limit theorems and its consequences.

Name of the Programme Name of the Course	: M.Sc. Mathematic : Mechanics	cs Semester Credits : 3	: I
Paper Type	: Internal Elective	Hours of Teaching: 90 h	rs
			Course
The objectives of the course is	to		
• study mechanical	systems under generaliz	zed coordinate systems.	
• study the details o	f virtual work		
 study energy and 	momentum		
 study the concept of 	of Hamilton I agrange		
UNIT-1 · Mechanical System	ms		18 hours
The Mechanical system - Ger	neralized coordinates - (Constraints - Virtual work	= Energy and
Momentum (Chapter 1: Secti	ons 1.1 to 1.5)		Energy und
UNIT-2 : Lagrange's Equat	ions		18 hours
Derivation of Lagrange's equ	ations- Examples - Inte	grals of motion.(Chapter 2	: Sections 2.1
to 2.3)	I	8	
UNIT-3: Hamilton's Equati	ons		18 hours
Hamilton's Principal - Hamilt	on's Equation - Other v	variational principle.	
(Chapter 4: Sections 4.1 to 4.	3)		
UNIT-4: Hamilton-Jacobi 7	Theory		18 hours
Hamilton Principal function -	Hamilton-Jacobi Equa	tion - Separability	
(Chapter 5: Sections 5.1 to 5.	3)		
UNIT-5: Canonical Transfo	ormation		18 hours
Differential forms and genera	ting functions - Lagran	ge and Poisson brackets. (Chapter 6:
Sections 6.1 to 6.3 (Omit sec	etion 6.2))		
Prescribed Book			
D. T. Greenwood, Cla	assical Dynamics, Prent	ice Hall of India, New De	lhi, 1985.
Reference Books: 1. H. Goldstein, <i>Classica</i>	al Mechanics, (2nd Edit	tion) Narosa Publishing H	ouse, New
Delhi.			
2. N.C.Rane and P.S.C.J	loag, Classical Mechan	ics, Tata McGraw Hill, 19	91.
3. J.L.Synge and B.A.G	riffth, Principles of Mec	chanics (3rd Edition) McG	raw Hill
Book Co., New York,	1970.		

E-Materials:

https://ocw.mit.edu/courses/physics/8-09-classical-mechanics-iii-fall-2014/

Course Learning Outcomes

- know mechanical systems under generalized coordinate systems.
- know the Derivation of Lagrange's equations.
- know the Hamilton's Principle.
- know the Hamilton-Jacobi Equation and separability.
- know the Lagrange and Poisson brackets.

Name of the Programme	: M.Sc. Mathematics Sen	nester	: I
Name of the Course	: Graph Theory	Credits	: 3
Paper Type	: Internal Elective	Hours of Tea	aching: 90 hrs

Course Objectives:

The objectives of the course is to

- study and develop the basic concepts of Graphs
- know the properties of graph theory
- understand various applications of certain topics of graph theory
- formulate and prove central theorems about trees, matching, connectivity, • coloring and planarity of graphs.
- apply the graph theoretical approach to solve the problems that are modeled as graphs

UNIT-1: Graphs, Subgraphsand Trees

Graphs - Graph Isomorphism - The Incidence and Adjacency Matrices - Subgraphs - Vertex Degrees - Paths and Connection - Cycles - Trees - Cut Edges and Bonds - Cut Vertices-Cayley's formula- Application: The shortest path problem (Chapter 1: Section 1.1 - 1.8, Chapter 2: Section 2.1 - 2.4)

UNIT-2: Connectivity, Euler Tours and Hamilton Cycles

Connectivity - Blocks - Euler tours - Hamilton Cycles. Application: The travelling Salesman Problem(Chapter 3: Section 3.1 - 3.3, Chapter 4: Section 4.1 - 4.2)

UNIT-3: Matchings, Edge Colourings

Matchings - Matchings and Coverings in Bipartite Graphs -Perfect matchings- Edge Colourings: Edge Chromatic Number - Vizing's Theorem. Application: Optimal Assignment Problem. (Chapter 5: Section 5.1 - 5.3, 5.5, Chapter 6: Section 6.1 - 6.2)

Unit-4: Independent Sets and Cliques, Vertex Colourings

Independent sets - Ramsey's Theorem - Vertex Colourings: Chromatic Number - Brooks' Theorem – Hajos Conjecture- Chromatic polynomial. (Chapter 7: Section 7.1 - 7.2Chapter 8: Section 8.1 – 8.2, 8.4)

UNIT-V: Planar Graphs

Plane and planar Graphs - Dual graphs - Euler's Formula - The Five-Colour Theorem and the Four-Colour Conjecture- Directed graphs.

(Chapter 9:Section 9.1 - 9.6(Omit 9.4, 9.5) and Chapter 10: Section 10.1)

Prescribed Book

J.A.Bondy and U.S.R. Murthy, Graph Theory and Applications, Macmillan, London, 1976.

Reference Books:

18 hours

18 hours

18 hours

18 hours

- 1. NarsinghDeo, Graph Theory with applications to engineering and computer science, Prentice Hall of India, New Delhi,2001.
- 2. G.Chartrand and L.Lesniak, Graphs and Digraphs, Chapman and Hall, CRC, fourth edition, 2005.
- 3. R.J. Wilson, *Introduction to Graph Theory*, Pearson Education, 4th Edition, 2004, Indian Print. S
- 4. A. Choudum, A First Course in Graph Theory, MacMillan India Ltd. 1987.
- 5. J. Clark and D.A. Holton , *A First look at Graph Theory*, Allied Publishers, New Delhi, 1995.
- 6. A. Gibbons, *Algorithmic Graph Theory*, Cambridge University Press, Cambridge, 1989.

E- Materials

https://nptel.ac.in/courses/111106050/

Course Learning Outcomes

- grasp features and properties of special graphs
- check the given graph is Eulerian or not. Also able to find the Eulerian circuit and Hamiltonian paths of the given graph.
- find the matching/perfect matching, connectivity of given graphs
- find independent sets and chromatic number of a given graph
- apply coloring and planarity of graphs in real life problems.

Name of the Programme:MA/M.Sc/M.ComSemester: IName of the Course: Basic Mathematics Credits: 3Paper Type: Non-Major ElectiveHours of Teaching: 90hrs------

-----Course Objectives:

The objectives of the course is to

- studyexponential and logarithmic series
- understandabout matrices and its applications
- formulate and solve the partial differential equations
- apply the results on Laplace transform
- learn the techniques on Fourier series.

Unit – 1: Exponential and Logarithmic series

Exponential series – Logarithmic series (Chapter 1: Section 1.1 – 1.2)

Unit – 2: Matrices

Determinant of a matrix – Characteristic equation of a matrix – Characteristic vectors of a matrix – Cayley-Hamilton Theorem – Inverse of a matrix. (Chapter 4: Section 4.1 - 4.5)

UNIT-3: Partial Differential Equations

Elimination of arbitrary constants – Elimination of arbitrary functions – Standard forms – Lagrange's Equations. (Chapter 9: Section 9.1 - 9.4)

UNIT-4: Laplace transforms

Properties of Laplace transform – Inverse Laplace transform – Partial Fractions. (Chapter 10: Section 10.1 - 10.3)

Unit-5: Fourier Series

Properties of Integration – Odd and Even Functions – Half Range Fourier Series. (Chapter 11: Section 11.1 - 11.3)

Prescribed Book

G. Britto Antony Xavier, V. Balaji, S.U. Vasantha Kumar, B. Govindan, Mathematical Sciences, Jayalakshmi Publications, 2-e, 2015.

Reference Books:

- 1. P. Balasubramaniyam, K. G. Subramanian, Ancillary Mathematics, Volume I, Tata McGraw Hill publishing company limited, New Delhi, 1996.
- 2. P. DuraiPandian, S. UdayaBaskaran, Allied Mathematics, Volume I, Muhil publishers, 1st Edition, Chennai, 1997.
- 3. P.Kandsamy and K. Thilagavathy, Allied Mathematics volume I, Volume II, S. Chand & Company, New Delhi, 2004.
- 4. Shanti Narayan, P.K.Mittal, Differential Calculus, S.Chand& Co, New Delhi, 2005.
- 5. A.Singaravelu, Allied Mathematics, Meenakshi Agency, Chennai, 2001.
- 6. P.R.Vittal, Allied Mathematics, Margham Publications, Chennai, 1999.

E- Materials

18 hours

18 hours

18 hours

18 hours

http://mathforum.org/library/drmath/sets/elem 2d

Course Learning Outcomes

- Acquire the knowledge of exponential and logarithmic series
- understanding about matrices and its applications
- formulate and solve the partial differential equations
- apply the results on Laplace transform
- learn the techniques on Fourier series.

Name of the Programme	: MA/M.Sc/M.Com	Semester	: I
Name of the Course	: Mathematical Foundations	Credits	: 3
Paper Type	: Non-Major Elective	Hours of Teaching: 90hrs	

Course Objectives:

The objectives of the course is to

• make the students familiar in Mathematics which are essential for developing computer applications

Unit - 1: Symbolic Logic

Proposition, Logical operators, conjunction, disjunction, negation, conditional and bi – conditional operators, converse, inverse, contra positive, logically equivalent, tautology and contradiction, Arguments and validity of argument.

(Chapter 1: Sections 1.1 - 1.5)

Unit - 2: Set Theory

Set, Set operations, Venn diagram, Properties of sets, number of elements in a set, Cartesian product, relation & functions, Relation : Equivalence relation. Equivalence class, Partially and Totally ordered sets, Functions : Types of Functions, Composition of Functions.

(Chapter 2: Sections 2.1 - 2.8)

Unit - 3: Binary Operations

Types of Binary operations: Commutative, Associative, Distributive and identity, Boolean algebra: properties, Permutations and combinations.

(Chapter 3: Sections 3.1 - 3.3)

Unit - 4: Differentiation

18 hours

18 hours

Simple problem using standard limits, $\lim_{x\to a} \frac{x^n - a^n}{x - a}$, $\lim_{x\to 0} \frac{\sin x}{x}$, $\lim_{x\to 0} \frac{\tan x}{x}$, $\lim_{x\to 0} e^x$, $\lim_{n\to 0} (1+1/n)^n / n$, $\lim_{n\to 0} (1+n)^{-1/n}$, Differentiation, successive differentiation, Leibnitz theorem, partial differentiation Applications of differentiation, Tangent and normal, angle between two curves, Maximum and minimum values [second derivative test], curvature and radius of curvature [Cartesian coordinates], Envelopes.

(Chapter 4: Sections 4.1 - 4.9)

Unit - 5: Two Dimensional Analytical Geometry

18 hours

18 hours

Straight lines – pair of straight lines – circles – System of Circles – Conics [parabola, Ellipse and Hyperbola].

(Chapter 5: Sections 5.1 - 5.5)

Prescribed Book

U. Rizwan, Mathematical Foundations Volume I, Nelliappar Publications, Chennai. 2017

Reference Books:

- 1. P.R Vittal, Mathematical Foundations, Margham Publication, Chennai.
- 2. V.Sundaram& others, Discrete Mathematical Foundations, A.P.Publication, Sirkali
- 3. P.Duraipandian& Others, Analytical Geometry of 2 and 3 Dimensions, Emerald Publication 1992 Reprint.

E- Materials

http://www.mathfoundation.com

Course Learning Outcomes

- understand mathematical logical operators.
- gain knowledge in set theory, binary operations with some problems.
- solve problems on applications of differentiation and two dimensional geometry.

Name of the Program		Semester	: I	
Name of the Course	: Mathematical Modeling	Credits	: 3	
Paper Type	: Non-Major Elective	Hours of Te	aching:90 hrs	

Course Objectives:

The objectives of the course is to

- provide an introduction to modelling and simulation
- solve and interpret real life problems using different Mathematical perspectives.

Unit- 1: Mathematical Modelling through Systems of Ordinary differential Equations of theFirst Order 18 hours

Mathematical modelling in population dynamics, Mathematical modelling of epidemicsthrough systems of ordinary differential equations of first order – MathematicalModels in Medicine, Arms Race, Battles and international Trade in terms of Systemsof ordinary differential equations - Mathematical modelling in dynamics through systems of ordinary differential equations of first order.(Chapter 3: 3.1, 3.2, 3.5, and 3.6)

Unit -2: Mathematical Modelling through difference equations 18 hours

The need for Mathematical modelling through difference equations - some simplemodels -Basic theory of linear difference equations with constant coefficients -Mathematical modelling through difference equations in economics and finance(Chapter 5: 5.1 to 5.3)

Unit-3: Mathematical Modelling through difference equations (contd.) 18 hours

Mathematical modelling through difference equations in population dynamics and genetics. Mathematical Modelling through difference equations in probability theory. Miscellaneous examples of Mathematical modelling through difference equations (Chapter 5: 5.4 to 5.6)

Unit -4: Mathematical modelling through Graphs

Situations that can be modeled through graphs - Mathematical models in terms ofdirected graphs - Mathematical models in terms of signed graphs – Mathematicalmodels in terms of weighted graphs.(Chapter 7: 7.1 to 7.4)

Unit- 5: Mathematical Modelling through calculus of Variations and Dynamic Programming 18 hours

Optimization principles and techniques - Mathematical modelling through calculus ofvariations - Mathematical Modelling through dynamic programming.(Chapter 9: 9.1 to 9.3)

Prescribed Book

J. N. Kapur, Mathematical Modelling, Willey Eastern Limited, Reprint, 2000. **Reference Books:**

1. D. J. G. James and J. J. Macdonald, Case studies in Mathematical Modelling, StanlyThames, Cheltonham.

- 2. M. Crossand A. O. Moscrcadini, The art of Mathematical Modelling, EllisHarwood and John Wiley.
- 3. C. Dyson, Elvery, Principles of Mathematical Modelling, Academic Press, NewYork.
- 4. D. N. Burghes, Modelling with Difference Equations, Ellis Harwood and JohnWiley.

E- Materials

http://www.mathfoundation.com

Course Learning Outcomes

- understand concept of modelling and simulation
- construct mathematical models of real world problems
 - solve the mathematical models using mathematical techniques

Name of the Programme	: M.Sc. Mathematics	Semester	: II	
Name of the Course	: Algebra - II	Credits	: 5	
Paper Type : Core		Hours of Teaching : 90hrs		
Course Objectives:				
The objectives of the cou	urse is to			

- attain depth knowledge about the algebraic structure of fields
- learn the concepts of fields, existence and properties of extension fields of polynomials
- provide the use of Galois Theory in discussing the existence of roots of the polynomials.
- learn about the finite fields and the important theorem related to division rings
- learn the Linear Algebra and apply them in various fields of Engineering and Technology.

Unit-1: Field Theory

Extension fields - Transcendence of e.(Chapter 5: Section 5.1 and 5.2)

Unit-2: Polynomials and Roots

Roots of Polynomials.- More about roots (Chapter 5: Sections 5.3 and 5.5)

Unit-3: Galois theory

Elements of Galois theory. (Chapter 5 : Section 5.6)

Unit-4: Finite Fields

Solvability by Radicals - Finite fields - Wedderburn's theorem on finite division rings.

(Chapter 5: Section 5.7, Chapter 7: Sections 7.1 and 7.2 (Only Theorem 7.2.1))

Unit-5: Solvability by Radicals

A theorem of Frobenius - Integral Quaternions and the Four -Square theorem. (Chapter 7 : Sections 7.3 and 7.4)

Prescribed Book

I.N. Herstein, Topics in Algebra, 2nd Edition. Wiley.1975

Reference Books:

- 1. D.S.Dummit and R.M.Foote. Abstract Algebra. Wiley 2003
- 2. M. Artin , Algebra, Prentice Hall of India, 1991J.A. Gallian. Contemporary Abstract Algebra. 4th Edition. Narosa Publishing 2011
- 3. P.B.Battacharya, S.K.Jain, and S.R.Nagpaul, *Basic Abstract Algebra*(II Edition) Cambridge University Press, 1997.(Indian Edition)
- 4. I.S. Luther and I.B.S.Passi, Algebra, Vol.I Groups(1996), Vol. II Rings, Narosa Publishing House, New Delhi, 1999.

18 hours

18 hours

18 hours

18 hours

- **5.** Rudolf Lidl and Gunter Pilz, Applied Abstract Algebra, Second Indian Reprint 2006, Springer Verlag, Newyork
- 6. L. Smith(1998). Linear transformation: Example and Applications. In: Linear Algebra, Undergraduate texts in Mathematics, Springer, New york. NY.

E- Materials

- 1. https://www.jmilne.org->FTe6
- 2. <u>https://www.jmilne.org>math</u>
- 3. <u>www.math.iitb.ac.in->Lecnotes</u>

E-Videos

- 1. https://nptel.ac.in/courses/111108098/
- 2. <u>https://ocw.mit.edu/courses/Lecture-notes/</u>
- 3. <u>https://mathdoctorbob.org/Algebra.html/</u>

Course Learning Outcomes

- demonstrate ability to find the extension field of polynomials. Also, gets the clear understanding of algebraic extensions and algebraic closures.
- work with the consequences of Galois Theory such as insolubility of certain classes of equations.
- work with finite fields and certain important theorems related to Finite division ring
- use of Frobenius integral quaternions and the Four square theorem.
Course Objectives

The objectives of the course is to

- understand the concepts like measure on the real line, Lebesguemeasurability and integrability
- study Fourier Series and Integralsin depth
- study multivariable calculus.
- know the Lebesgue Integral

Unit-1:Fourier Series and Fourier Integrals

Introduction – Orthogonal system of functions – The theorem on best approximation –The Fourier series of function relative to an orthonormal system - Properties of Fourier Coefficients- The Riesz-Fischer Theorem - The convergence and representation problems for trigonometric series - The Reimann-Lebesgue Lemma - The Dirichlet Integrals - An Integral representation for the partial sums of Fourier series -Reimann's localization theorem- Sufficient conditions for convergence of a Fourier Series at a particular point -Cesarosummability of Fourier series - Consequences of Fejes's theorem -The Weiestrass approximation theorem. (Textbook 1: Chapter 11: Sections 11.1 to 11.15)

Unit-2:Multivariable Differential Calculus

Introduction – The Directional derivative – Directional derivative and continuity – The total derivative - The total derivative expressed in terms of partial derivatives -An Applications to Complex - Valued Functions - The matrix of linear function- The Jacobian matrix - The chain rule - Matrix form of chain rule - The mean-value theorem for differentiable functions - A sufficient condition for differentiability- A sufficient condition for equality of mixed partial derivatives – Taylor's theorem for functions of R^n to R^1 .

(Textbook 1: Chapter 12: Sections 12.1 to12.14)

Unit-3: Implicit Functions and Extremum Problems

Introduction- Functions with non-zero Jacobian determinants - The inverse function theorem -The Implicit function Theorem -Extrema of real valued functions of one variable and several variables -Extremum problems with side conditions. (Textbook 1: Chapter 13: Sections 13.1 to 13.7)

18 hours

18 hours

Unit-4: The Lebesgue Integral

Length of open sets and closed sets – Inner and outer measure : Measurable sets – Properties of measurable sets – Measurable functions – Definition and existence of the Lebesgue integral for bounded function.(Textbook 2: Chapter 11: Sections 11.1 to 11.5)

Unit -5: The Lebesgue Integral(Cont.)

18 hours

Properties of the Lebesgue integral for bounded measurable functions – The Lebesque integral for unbounded functions – Some fundamental theorems – The metric space $L^2[a, b]$. (Textbook 2: Chapter 11: Sections 11.6 to 11.9)

Prescribed Books

- Tom M. Apostol, Mathematical Analysis (Second Edition) (1981), Addison Wesley Publishing Company Inc. New York, (for units I, II& III).
- Richard R. Goldberg, Methods Of Real Analysis (1975), Oxford & IBH Publishing, New Delhi (for Unit IV & V).

Reference Books:

- 1. J. C. Burkill, TheLebesgue Integral (1951), Cambridge University Press.
- 2. M. E. Munroe, Measure And Integration (1971), Addison-Wiley.
- 3. H. L. Roydon, Real Analysis (1988), Macmillan Pub. Company, New York.
- 4. W. Rudin, Principles of Mathematical Analysis (1979), McGraw Hill Company, New York.
- S. C. Malik and SavitaArora, Mathematical Analysis (1991), Wiley Eastern Limited, New Delhi.
- Sanjay Arora and BansiLal, SatyaPrakashan, Introduction To Real Analysis, (1991), New Delhi.

E-Materials:

https://ocw.mit.edu/courses/mathematics/18-100b-analysis-i-fall-2010/

Course Learning Outcomes

After the successful completion of this course, the students will be able to:

- understand the concept of Fouier series and Fourier integrals
- analyse he functions of several variables.
- discuss the inverse function theorem and implicit function theorem
- acquire the knowledge of Lebesgue measure
- analyse the concept of inner and outer measure

Name of the Programme: M.Sc. MathematicsSemester: IIName of the Course: PartialDifferentialEquationsCredits: 4PaperType: CoreHours of Teaching : 90hrs------

Course Objectives

The objectives of the course is to

- familiarize students to understand the theory and methods of PartialDifferential Equations (PDEs).
- prepare students to apply and solve PDEs applications from variousemerging technologies.
- introduce the concepts and solving methods of First and second orderpartial differential equations.
- introduce the concepts and solving methods of Elliptical, paraboloid, hyperbolic differentialequations.
- examine the existence and uniqueness of solutions of differential equations

Unit- 1: Partial Differential Equations of First Order

Formation and solutions of first order PDE – Integral surfaces – The Cauchy problem for first order equation –Orthogonal surfaces – First order non-linear equations – characteristics – compatible systems of first order equations - Charpit's method. (Chapter -0: sections 0.4 to 0.11. (omit 0.11.1))

Unit -2: Fundementals of Second OrderPDE

Introduction – classification of second order PDE – canonical forms – Adjoint operators. (Chapter - 1: sections 1.1 to 1.4)

Unit-3: Elliptic Differential Equations

Derivation of Laplace and Poisson equations – Boundary value problem – Separation of variables – Dirichlet's and Newmann problems for a rectangle – Solution of Laplace equation in Cylindrical and sphericalcoordinates. (Chapter - 2 : Sections 2.1, 2.2, 2.5 to 2.7, 2.11 to 2.12)

Unit-4: Paraboloid Differential Equations

Formation and elementary solution of diffusion equation with boundary conditions – Dirac-Delta function – Separation of variable method - Solution of diffusion equation in cylindrical and spherical coordinates.(Chapter - 3 : Sections 3.1 to 3.7)

25

18 hours

18 hours

18 hours

Unit-5: Hyperbolic Differential Equations

Derivation and solution of 1-D wave equation by canonical reduction – Initial Value Problem ;D'Alembert's solution – IVP and BVP for 2-D wave equation – Periodic solution for 1-D wave equation in cylindrical and spherical coordinates systems –Uniqueness of the solution for 1-D wave equation – Duhamel's principle. (Chapter - 4: Sections 4.1 to 4.4, 4.7 to 4.9, 4.11 and 4.12)

Prescribed Book

K.SankaraRao, Introduction to Partial differential equations (Third edition), Prentice-Hall of India Ltd., New Delhi, 2016.

Reference Books:

- 1. I.N. Sneddon, Elements of partial differential equations, McGraw Hill bookcompany, Singapore,1957
- 2. R. Dennemeyer, Introduction to partial differential equations and boundary value problems, McGraw Hill, New York, 1968.
- 3. R.C. McOwen, Partial differential equations, 2ndedition, Pearson education, New Delhi,2005.
- 4. M.D.Raisinghania, Advanced differential equations, S.Chand& Company Ltd.New Delhi,2001.
- 5. N.N. Lebedev, Special functions and their applications, Prentice Hall of India,New Delhi,1965.

E-Materials:

- 1. <u>https://ocw.mit.edu/courses/mathematics/18-152-introduction-to-partial-differential- equations-fall-2011/</u>
- 2. https://nptel.ac.in/courses/111103021/
- 3. <u>https://ocw.mit.edu/courses/mathematics/18-306-advanced-partial-differential-equations- with-applications-fall-2009/</u>

Course Learning Outcomes

After the successful completion of this course, the students will be able to:

- formulate and solve Partial Differential Equations (PDE) and apply PDE problems for real timeapplications.
- solve partial differential equations of first and second order.
- classify the partial differential equations
- identify the canonical forms of the partial differential equations.
- analyse the solution of Laplace, Diffusion and Wave equations n Cylindrical and polar coordinates
- discuss the existence and uniqueness of solutions and Duhamel's principle

Name of the Programme	: M.Sc. Mathematics Seme	ster : II	
Name of the Course	: Mathematical Statistics	Credits	: 3
Paper Type	: Internal Elective	Hours of Teaching :	75hrs

Course Objectives:

The objectives of the course is to

- introduce the basic notions of sample, population, sample moments and their functions.
- give an insight about the parametric and non-parametric tests for small and large samples.
- educate the various measures of estimation theory.
- inculcate the concepts of ANOVA test and hypothesis testing. •
- indoctrinate the strong background about the sequential analysis and its consequences. ٠

Unit-1: Sample Moments and Their Functions

Notion of a Sample and a Statistic - Distribution of the Arithmetic Mean of Independent Normally Distributed Random Variables - The Chi-Square Distribution - The Distribution of the Statistics - Student's t-Distribution - Fisher's Z-Distribution - Snedecor'sF-Distribution – Distribution of Sample Mean from Non-Normal Populations. (Chapter 9 – Sections: 9.1–9.8)

Unit-2: Significance Tests

Kolmogorov Theorem - Smirnov Theorem - The Concept of a Statistical Test - Parametric Tests for Small Samples and Large Samples - Chi-Square Test - Tests of Kolmogorov and Smirnov Type - The Wald-Wolfovitz and Wilcoxon-Mann-Whitney Tests - Independence Tests by Contingency Tables. (Chapter 10 – Sections: 10.11 and Chapter 12 – Sections: 12.1 - 12.7)

Unit–3: Estimation Theory

Preliminary Notion - Consistent Estimaties - Unbiased Estimates - Sufficiency of an Estimate - Efficiency of an Estimate - Asymptotically Most Efficient Estimates - Methods of Finding Estimates– Confidence Interval.(Chapter 13 – Sections: 13.1–13.8)

Unit-4: Analysis of Variance and Hypotheses Testing

ANOVA Test: One-Way Classification and Two-Way Classification. Hypotheses Testing: The Power Functions and OC Function - Most Powerful Test - Uniformly Most Powerful Test - Unbiased Test.(Chapter 15 - Sections: 15.1-15.2 and Chapter 16 - Sections: 16.1-16.5)

Unit-5: Elements of Sequential Analysis

15 Hours

15 Hours

15 Hours

15 Hours

15 Hours

SPRT – Auxiliary Theorem – Wald's Fundamental Identity – OC Function and SPRT – The Expected Value of E(n) – Determination of A and B – Testing a Hypothesis Concerning p of Zero-One Distribution – Testing a Hypothesis Concerning the Expected Value m of a Normal Population. (Chapter 17 – Sections: 17.1–17.9)

Prescribed Book

M. Fisz, *Probability Theory and Mathematical Statistics*, 3rd Edition, John Wiley and Sons Inc., New York, 1963.

Reference Books:

- 1. V.K. Rohatgi and A.K.Md.E. Saleh, *An Introduction to Probability Theory and Mathematical Statistics*, 2nd Edition, Wiley Eastern Ltd., New Delhi, 1988.
- 2. E.J. Dudewicz and S.N. Mishra, *Modern Mathematical Statistics*, John Wiley and Sons, New York, 1988.
- 3. G.G. Roussas, *A First Course in Mathematical Statistics*, 2nd Edition, Academic Press, USA, 1997.
- 4. B.L.V.D. Waerden, *Mathematical Statistics*, Springer-Verlag, New York, 1969.
- 5. R.E. Walpole, R.H. Myers, S.L. Mayers and K. Ye, *Probability and Statistics for Engineers and Scientists*, 9th Edition, Pearson Education Inc., 2012.

E-Materials:

- 1. <u>https://ocw.mit.edu/courses/mathematics/18-655-mathematical-statistics-spring-2016/</u>
- 2. <u>https://www.coursera.org/learn/basic-statistics</u>
- 3. <u>https://swayam.gov.in/nd1_noc20_ma19/preview</u>

Course Learning Outcomes

After the successful completion of this course, the students will be able to:

- know the basic notions of sample, population, sample moments and their functions.
- comprehend the parametric and non-parametric tests for small and large samples.
- understand the various measures of estimation theory.
- acquire the concepts of ANOVA test and hypothesis testing.
- procure the strong background about the sequential analysis and its consequences.

Name of the Programme: 1	Semester	: II	
Name of the Course	: Fuzzy Set Theory	Credits	: 3
Paper Type	: Internal Elective	Hours of Teac	hing:75hrs

Course Objectives:

The objectives of the course is to

- introduce Fuzzy sets
- some operations on Fuzzy sets
- construction of Fuzzy sets

Unit-1: From Classical (Crisp) Sets to Fuzzy Sets 15 hours Introduction – Crisp sets: An overview – Fuzzy sets – Basic types – Basic concepts – Characteristics – Significance of the paradigm shift. (Chapter 1: Sections 1.1 to 1.5)

Unit - 2: Fuzzy Sets Versus Crisp Sets

Additional properties of α - Cuts – Representation of Fuzzy sets – Extension principle for Fuzzy sets. (Chapter 2: Sections 2.1 to 2.3)

Unit-3: Operations on Fuzzy Sets

Types of Operation – Fuzzy complements – Fuzzy intersection – t-norms (Chapter 3: Sections 3.1 to 3.3)

Unit-4: Operations on Fuzzy Sets

Fuzzy unions – t conorms – Combinations of operations – Aggregation operations. (Chapter 3: Sections 3.4 to 3.6)

Unit-5: Fuzzy Arithmetic

Fuzzy numbers – Linguistic Variables – Arithmetic operation on intervals – Arithmetic operation on Fuzzy numbers (Chapter 4: Sections 4.1 to 4.4)

Prescribed Book

G. J. Klir and Bo Yuan, Fuzzy Sets and Fuzzy Logic : Theory and Applications, PHI, New Delhi, 2005.

Reference Books:

- 1. H. J. Zimmerman, Fuzzy Set Theory and its Applications, Allied Publishers, 1996.
- 2. A. Kaufman, Introduction to the theory of Fuzzy Subsets, Academic Press, 1975.
- 3. V. Novak, Fuzzy Sets and their Applications, Adam Hilger, Bristol, 1969.

E-Materials:

http://nptel.ac.in/courses/105108081/module9/lecture36/lecture.pdf

Course Learning Outcomes

After the successful completion of this course, the students will be able to:

- understand the basic concepts of Fuzzy Sets and the difference between the Fuzzy sets and crisp sets
- analyse the Fuzzy sets and additional properties of α cuts.

15 hours

15 hours

15 hours

- discuss the operations on Fuzzy sets and Fuzzy complements
- acquire the knowledge of various noms on Fuzzy sets and combination of operations
- visualize the Fuzzy sets as Fuzzy numbers
- analysethe Linguistic Variables, Arithmetic operation on intervals, Arithmetic operation on Fuzzy numbers
- apply the concepts of Fuzzy mathematics in real life situation.

Name of the Program		Semester	: II			
Name of the Course	: Difference Equation	ons	Credits	:	3	
Paper Type	: Internal Elective	Hours	of Teach	ing : 75hrs-		
				Со	urse Objec	tives:

The objectives of the course is to

- introduce the process of discretization, discrete version of Difference Equations •
- study the oscillation and the asymptotic behaviour of solutions of certain class of difference equations.
- solvethe difference equations using Z-transforms.

Unit – I: Linear Difference Equations of Higher order 15 hours

Difference Calculus - General Theory of Linear Difference Equations - Linear Homogeneous Equations with Constant coefficients - Non-homogeneous equations: Method of Undetermined Coefficients, the method of variation of constants - Limiting behavior of Solutions. (Chapter 2, Sections: 2.1 to 2.5)

Unit - II: System of Linear Difference Equations 15 hours

Autonomous Systems - The Basic Theory - The Jordan form - Linear periodic systems. (Chapter 3, Sections: 3.1 to 3.4)

Unit – III: The Z-transform Method

Definitions and Examples, Properties of Z-transform - The Inverse Z-transform and Solutions of Difference Equations: Power series method, partial fraction method, the inverse integral method - Volterra Difference Equation of convolution type - Volterra Systems. (Chapter 6, Sections: 6.1 to 6.3, 6.5)

Unit – IV: Oscillation Theory

Three-term difference Equations - Self-Adjoint Second Order Equations - Nonlinear Difference Equations. (Chapter 7, Sections: 7.1 to 7.3)

Unit – V: Asymptotic Behaviour of Difference Equation

Tools of Approximation - Poincare's Theorem - Asymptotically Diagonal Systems - High-Order Difference Equations - Second Order Difference Equations. (Chapter 8, Sections: 8.1 to 8.5)

Prescribed Book

Saber N. Elaydi, An Introduction to Difference Equations, Third Edition, Springer Verlag, New York, 2005 (First Indian Reprint 2008).

Reference Books:

- 1. Ronald E. Mickens, Difference Equations Theory, Applications and Advanced Topics, Third Edition, CRC Press, New York, 2015.
- 2. R. P. Agarwal., Difference Equations and Inequalities, Marcel Dekker, 1999.
- 3. S. Goldberg, Introduction to Difference Equations, Dover Publications, 1986

15 hours

15 hours

- 4. V. Lakshmikantham and Trigiante, *Theory of Difference Equations Numerical Methods and Applications*, Second Edition, Academic Press, New York, 1988.
- 5. Walter G. Kelly, Allan C. Peterson, *Difference Equations, An Introduction with Applications,* Academic Press, New York, 2001 (First Indian Reprint 2006).

E-Materials:

- 1. http://people.math.aau.dk/~matarne/11-imat/notes2011a.pdf,
- 2. http://pj.freefaculty.org/guides/stat/Math/DifferenceEquations/DifferenceEquations-guide.pdf

Course Learning Outcomes

After the successful completion of this course, the students will be able to:

- solve problems on Linear Difference Equations of Higher order
- understand the system of Linear Difference Equations
- apply Z-transform techniques in difference equations
- solve problems on Oscillation Theory and Asymptotic Behaviour of Difference Equation

Name of the Programme: MA/M.Sc/M.ComSemester: IIName of the Paper: Fundamentals of InsuranceCredits:3Paper Type: Non-Major ElectiveHours of Teaching: 75hrs

Course Objectives:

The objectives of the course is to

- know about the different insurance sectors including life insurance
- provide the idea of time of maturity, revival and surrender of policies and claims
- study about the Marine and Fire insurance

UNIT – I15 hours

Introduction to Insurance-Meaning, Definition of insurance- General principles of insurance-Types of insurance life, fire and marine-Difference between life and other types of insurance, Growth & Developmentof Indian insurance industry- Regulations of insurance business and the emerging scenario.

UNIT-II15

Life Insurance-Introduction to life insurance : Features of life insurance-Essentials of life insurance,Different types of life policies- Annuities, Formation of life insurance contracts-Assignment and nominations- Lapses and revivals of policies. Surrender value, paid up value, Loans-Claims- Procedure forclaims- Settlement of claims- Death and Maturity.

UNIT-III15

Fire Insurance- Fire insurance contracts- Fire insurance coverage- Policies for stocks- Rate fixation in fireinsurance- Settlement of claims. **Marine Insurance**- Functions- Marine perils-Types of marine policiesClauses in general use-Warranties and conditions- proximate cause-subrogation and conciliation - Reinsurance- Double insurance-Types of marine losses.

Miscellaneous Insurance - Motor insurance - Employer's liability insurance- Personal accident and sicknessinsurance - Aviation insurance- Burglary insurance- Fidelity guarantee insurance - Engineering insurancecattle insurance - Crop insurance.

Procedure for becoming an Agent- Pre-requisite for obtaining a license- Duration of license-Cancellation of license- Termination of agency - Code of Conduct- Functions of the Agent.

Prescribed Book

1. Fundamentals of Insurance - Dr. Periyasamy, Himalaya Publishing Pvt Ltd, Mumbai.

arcono1

hours

- 2. Insurance principles and practice Moorthy. A ,Margham publications, Chennai.
- 3. Fundamentals of insurance Dr. P. K. Guptha, Margham publications, Chennai

Reference Books:

- 1. Insurance principles and practice- Periasamy. P, Margham publications, Chennai
- 2. Insurance principles and practice Mishra. M. N, Sultan Chand & Sons, NewDelhi
- Insurance principles and practice- Balu. V. &Premilan, Margham publications, Chennai

E-Materials:

- <u>https://ocw.mit.edu/courses/economics/14-73-the-challenge-of-world-poverty-spring-2011/video-lectures/lecture-15-risk-and-insurance/</u>
- <u>https://ocw.mit.edu/courses/economics/14-73-the-challenge-of-world-poverty-spring-2011/video-lectures/lecture-16-insurance/</u>

Course Learning Outcomes

After the successful completion of this course, the students will be able to:

- understand the principles and regulations of Insurance
- analyse the benefits of life insurance policies
- discuss the marine insurance and its benefits
- discuss the fire insurance and its benefits
- analyse the various insurance sector
- understand the duties of an agent and procedure to get license.

Name of the	Programme :MA/M.Sc/M.Co	om Semester	: II	
Name of the	Course : Numerical Method	s Credits	: 3	Paper
Туре	: Non-Major Elective	Hours of Teaching:	75hrs	

Course Objectives:

The objectives of the course is to

- understand the concept of interpolation
- study the various methods to obtain interpolation with equal and unequal intervals
- study the numerical integration
- find the roots of the system of equation
- solve the differential equations using various numerical methods
- fit a curve using the method of least squares.

Unit-115 hours

Solution of numerical algebraic and transcendental Equations:

Bisection method – Iteration Method –Newton-Raphson method

Solution of simultaneous linear algebraic equations:

Gauss elimination method – Gauss-Jordan elimination method –Gauss Jacobi method – Gauss Seidel method– Simple Problems.

Chapter 3: Sections 3.1, 3.1.1, 3.2, 3.4

Chapter 4: Sections 4.1, 4.2, 4.2.1, 4.8, 4.9.

Unit-215 hours

Interpolation:

Introduction – Newton's forward and backward formulae –Central differences– Gauss forward andbackward formulae – Stirlings formula–Divided differences – Properties– Relations between divided differences and forwarddifferences - Newton's divided differences formula – Lagrange's formula.

Chapter 6: Sections 6.1, 6.2, 6.3 Chapter 7: Sections 7.1, 7.3, 7.4, 7.5

Chapter 8: Sections 8.2, 8.3, 8.4, 8.5, 8.7

Unit-315 hours

Numerical Differentiation:

Newton's forward and backward formulae to compute the derivatives – Derivative using Stirlings formulae – to find maxima and minima of the function given the tabular values.

Chapter 9: Sections 9.2, 9.3, 9.4, 9.6

Unit-415 hours

Numerical Integration:

 $Newton-Cote's\ formula-Trapezoidal\ rule-Simpson's\ 1/3_{rd}\ and\ 3/8_{th}\ rules-Weddle\ rule.$ Chapter 9: Sections 9.8, 9.9, 9.13, 9.14, 9.15

Unit-515 hours

Numerical solution of ordinary differential equations - Euler's method –Improved Euler's method - Modified Euler's method - Runge-Kutta method(Fourth order only). Chapter 11: Sections 11.9, 11.10, 11.11, 11.12, 11.13.

Prescribed Book

Kandasamy. P, Thilagavathi. K and Gunavathi.K "Numerical methods" – S. Chand and Company Ltd, New Delhi – Third Revised Edition 2016.

Reference Books:

- 1. Venkataraman M. K.,"Numerical Methods in Science and Engineering" National Publishing company V Edition 1999.
- 2. SankaraRao K., "Numerical Methods for Scientists and Engineers" 2nd Edition Prentice HallIndia 2004.
- 3. Gupta B.D., Numerical Analysis, Konark Publishers Pvt. Ltd.

E-Materials:

- 1. http://nptel.ac.in/courses/122102009/,
- 2. http://www.math.ust.hk/~machas/numerical-methods.pdf

Course Learning Outcomes

After the successful completion of this course, the students will be able to:

- solve the algebraic and transcendental equations
- understand the concept of interpolation with equal and unequal intervals
- analyse the properties of divided difference
- study the various methods for numerical differentiation
- discuss the various methods for numerical integration
- gain the knowledge of Euler's method, modified Euler's method and Runge-Kutta method.

Name of the Programme:MA/M.Sc/M.ComSemester: IIName of the Course: Fundamentals of BusinessStatisticsCredits: 3Paper Type: Non-Major ElectiveHours of Teaching: 75 hrs------

Course Objectives:

The objectives of the course is to

• apply statistical techniques for interpreting and drawing conclusion for business problems.

Unit – I: Partial and Multiple Correlation

Introduction - Partial Correlation – Multiple Correlation – Multiple Regression Analysis – Reliability of Estimates-Miscellaneous Illustrations (Volume – II: Chapter 9: Pages: 1109 to 1135)

Unit –II: Theory of Probability and Theoretical Distributions

Introduction – Probability Defined – Importance of the Concept of Probability – Calculation of Probability – Theorems of Probability - Conditional Probability - Bayes' theorem – Probability Distribution – Binomial Distribution - Poisson Distribution. (Volume – II: Chapter 1: Pages: 751 to 770 and 774 to 788; Chapter 2: Pages: 806 to 823, 826 to 833 and 858 to 879)

Unit – III: Statistical Inference-Test of Hypothesis

Introduction – Sampling Error and Sampling Distribution – Estimation – Test of Significance for Large Samples – Test of Significance for Small Samples - Miscellaneous Illustrations. (Volume – II: Chapter 3: Pages: 882 to 951)

Unit – IV: Chi square and Goodness of Fit

Introduction - Chi square defined – Conditions of Additive Chi-Square Test – Yate's Corrections - Uses of Chi-Square Test – Additive Property of Chi-Square – Chi-Square Test for Specified Value of Population Variance – Miscellaneous Illustrations. (Volume – II: Chapter 4: Pages: 953 to 1003)

Unit- V: F-Test and Analysis of Variance

The F Test or the Variance Ratio Test – Application F Test – Analysis of Variance – Assumptions In Analysis of Variance – Technique of Analysis of Variance – Coding data – Analysis of Variance in Two-Way Classification Model. (Volume – II: Chapter 5: Pages: 1006 to 1038)

Prescribed Book

S.P. Gupta, Statistical Methods, Volume I & Volume II, Sultan Chand & Sons, New Delhi, 2009.

Reference Books:

- 1. S.C. Gupta and V.K. Kapoor, Fundamentals of Mathematical Statistics, 11-e, Sultan Chand & Sons, New Delhi, 2004.
- S. P. Gupta & M. P. Gupta, Business Statistics, 14th enlarged edition, Sultan Chand & Sons, Educational publishers, New Delhi, reprint 2007.

15 hours

15 hours

15 hours

15 hours

- 3. Richard I Levin and David S. Rubit, Statistics for Management, Seventh edition, Pearson Education, New Delhi, 2002.
- 4. P.R. Vittal, Business Mathematics and Statistics, Margham Publications, Sixth revised edition, 2011.

E-Materials:

http://mathworld.wolfram.com

Course Learning Outcomes

After the successful completion of this course, the students will be able to:

- know about the Partial and Multiple Correlation
- understand the basics concepts of Probability and Theoretical Distributions
- identify the educated guess (hypothesis)
- analyse the statistical inferences-Test of Hypothesis, Chi square and Goodness of Fit and F-Test
- design and discuss the Analysis of Variance

ANNAMALAI UNIVERSITY BACHELOR OF SCIENCE B.Sc. PHYSICS DEGREE COURSE

(2021 - 2022)

The Course of Study and the Scheme of Examinations

Stuc		Study Comp	onents	Ins.						
S. No.	Part	Course Title		Hrs / week	Credit	Title of the Paper	Max	kimum N	1arks	
		SEMEST	ER I				CIA	Uni. Exam	Total	
1	Ι	Language	Paper-1	6	4	Tamil/Other Languages	25	75	100	
2	П	English (CE)	Paper-1	6	4	Communicative English I	25	75	100	
3	III	Core Theory	Paper-1	6	4	Mechanics	25	75	100	
5	ш	Allied -1	Paper-1	4	3	Chemistry I or Biochemistry I	25	75	100	
6	III	Allied Practical	Practical-1	2	0		0	0	0	
7	III	PE	Paper 1	6	3	Professional English I	25	75	100	
8	IV	Environmental Studies		2	2	Environmental studies	25	75	100	
		Sem. Total		36	20		150	450	600	
		SEME					CIA	Uni. Exam	Total	
8	1		Paner-2	6	4	Tamil/Other Languages	25	75	100	
9		English (CF)	Paper-2	6	4	Communicative English II	25	75	100	
10		Core Theory	Paper-2	4	4	Heat and Thermodynamics	25	75	100	
11	Ш	Core Practical	Practical-1	3	2	Practical - I	25	75	100	
12										
12	ш	Allied-1	Paper-2	4	3	Chemistry II or Biochemistry II	25	75	100	
12	 	Allied-1 Allied Practical	Paper-2 Practical-1	4	3	Chemistry II or Biochemistry II Practical-Allied	25 25	75 75	100 100	
12 13 14	 	Allied-1 Allied Practical PE	Paper-2 Practical-1 Paper 1	4 2 6	3 2 3	Chemistry II or Biochemistry II Practical-Allied Professional English II	25 25 25	75 75 75	100 100 100	
12 13 14 15	 V	Allied-1 Allied Practical PE Value Education	Paper-2 Practical-1 Paper 1	4 2 6 2	3 2 3 2	Chemistry II or Biochemistry II Practical-Allied Professional English II Value Education	25 25 25 25	75 75 75 75	100 100 100 100	
12 13 14 15 16	 V V	Allied-1 Allied Practical PE Value Education Soft Skill	Paper-2 Practical-1 Paper 1	4 2 6 2 2	3 2 3 2 1	Chemistry II or Biochemistry II Practical-Allied Professional English II Value Education Soft Skill	25 25 25 25 25 25	75 75 75 75 75	100 100 100 100 100	
12 13 14 15 16	 V V	Allied-1 Allied Practical PE Value Education Soft Skill Sem. Total	Paper-2 Practical-1 Paper 1	4 2 6 2 2 36	3 2 3 2 1 25	Chemistry II or Biochemistry II Practical-Allied Professional English II Value Education Soft Skill	25 25 25 25 25 25 225	75 75 75 75 75 675	100 100 100 100 100 900	

B.Sc. PHYSICS

SYLLABUS CBCS PATTERN (2021 - 2022)

SEMESTER I

CORE PAPER - 1

MECHANICS

Course Objectives

- 1. To know the basics of vectors algebra and the dynamic of a system
- 2. To understand the dynamics of rigid bodies
- 3. To learn the concept of work, energy and collisions
- 4. To study the basics of elasticity
- 5. To expose the knowledge on gravitation and satellites

UNIT-1: Vectors and Dynamics

Introduction to Vectors - Vector algebra-Scalar and vector products-Gradient of a scalar field - Divergence of a vector field - Line integral - Curl of a vector field - Surface and volume integrals -Stoke's theorem - Gauss theorem of divergence - Green's theorem -Newton's laws of motion-Principle of conservation of momentum-Impulse-Projectile-Range on an inclined plane- Range and Time of fight down an inclined plane-Two body problem and the reduced mass-Centre of mass-Centre of gravity-Centre of gravity of a solid tetrahedron-Analytical problems solving.

UNIT-2: Dynamics of rigid bodies

Rotational kinetic energy and moment of inertia-Angular acceleration and angular momentum-Law of conservation of angular momentum-Torque-Work done by a torque-Theorem of perpendicular and parallel axes-Moment of inertia of a thin uniform rod-rectangular lamina-uniform circular disc (through the centre of gravity for all)-Determination of acceleration due to gravity-Compound pendulum-Centre of suspension and centre of oscillation are interchangeable- Bifilar pendulum (parallel threads)- Analytical problems solving.

UNIT-3: Work, Energy & Collisions

Work-Energy Theorem – Conservative forces - Potential Energy-Force as gradient of potential energy-Principle of conservation of energy of a freely falling body.

Elastic and inelastic collisions-Coefficient of restitution-Oblique impact of a smooth sphere on a fixed smooth plane-Oblique impact of two smooth spheres-Loss of kinetic energy due to oblique impact- Analytical problems solving.

UNIT-IV: Elasticity

Elastic moduli-Hooke's law- Relation between elastic constants – Poisson's Ratio - Work done in stretching twisting a wire-Twisting couple on a cylinder-Rigidity modulus of a wire by Torsional pendulum-Rigidity modulus of a rod by Static torsion method-Bending of beams -Expression for bending moment – Cantilever -Expression for depression at the loaded end- Non-uniform bending-Determination of young's modulus pin & microscope and Koenig's method- Uniform bending-Expression for elevation – Experiment to determine young's modulus using optic lever method- Analytical problems solving,

UNIT-V: Gravitation

Law of gravitation-Acceleration due to gravity- Inertial mass and gravitational mass-Gravitational field-Gravitational potential-Gravitational potential energy- Potential and field due to spherical shell and solid sphere.

Kepler's Laws-Basic principles of rocket motion-Rocket Equation, thrust and acceleration-Escape velocity-Orbital velocity-Satellite in circular orbit-Geosynchronous orbits-Weightlessness- Basic idea of global positioning system (GPS)-Physiological effects on astronauts- Analytical problems solving.

Course outcomes

- 1. After studied unit-1, the student will be able to know fundamentals of vectors and able to formulate the expression for projectiles.
- 2. After studied unit-2, the student will be able to study the dynamics of rigid bodies in terms of moment inertia and also able to find the moment of inertia of different systems.
- 3. After studied unit-3, the student will be able to define work, energy and also able to understand the oblique impact between smooth spheres.
- 4. After studied unit-4, the student will be able to learn the elastic property of the solid materials and also derive the relation between elastic moduli.
- 5. After studied unit-5, the student will be able to explain the concept of gravitation and able to know the principles of rocket and satellite.

Text Books

Unit 1

1. R. Murugeshan, Mechanics and Mathematical methods, S.Chand&Co.Ltd, New Delhi, 2016

Unit 2

1. BrijLal and N. Subrahmanyam, Properties of Matter, S.Chand&Co.Ltd, New Delhi, 2002

Unit 3

- 1. M. Narayanamurti and N.Nagartnam, Dynamics, The National Publishing Company, Chennai, 2005.
- 2. Prof. D.S. Mathur revised byDr.P.S. Hemne, Mechanics, S. Chand and Company Limited, 2014

3. R. Murugeshan, Mechanics and Mathematical methods, S.Chand&Co.Ltd, New Delhi, 2016

Unit 4

- R. Murugeshan, Properties of Matter and Acoustics, S.Chand&Co.Ltd, New Delhi, 2016
- 2. BrijLal and N. Subrahmanyam, Properties of Matter, S.Chand&Co.Ltd, New Delhi, 2002
- 3. K. Ilangovan, Properties of Matter and Sound, Ananda Book Depot, Chennai, 2018.
- 4. J.Jayachitra and M. Gunasekaran, Properties of Matter and Acoustics, KRU Publications, Kumbakonam, 2007.

Unit 5

- 1. BrijLal and N. Subrahmanyam, Properties of Matter, S.Chand&Co.Ltd, New Delhi, 2002
- 2. Prof. D.S. Mathur revised byDr.P.S. Hemne, Mechanics, S. Chand and Company Limited, 2014

Reference Books

- 1. Sathyaprakash, Mathematical Physics, Sultanchand& Sons, New Delhi, Revised Ed.
- 2. Resnick, Halliday and Walker, Physics, 8/e. 2008, Wiley
- 3. J.W. Jewett, R.A. Serway , Physics for scientists and Engineers with Modern Phys., , 2010, Cengage Learning
- 4. R.P.Feynman, R.B.Leighton, M.Sands , Feynman Lectures, Vol. I, , 2008, Pearson Education
- 5. M.R. Spiegel, Theoretical Mechanics, , 2006, Tata McGraw Hill.
- 6. C.Kittel, W.Knight, et.al, Mechanics, Berkeley Physics, vol.1. 2007, Tata McGraw-Hill.
- 7. G.R. Fowles and G.L. Cassiday, Analytical Mechanics, 2005, Cengage Learning.
- 8. Higher Secondary Plus 1 and Plus 2 Physics Books- TN State Board and NCERT Books.

E-Materials

- 1. https://sites.google.com/a/euhsd.org/physics/
- 2. https://en.wikipedia.org/wiki/Euclidean_vector
- 3. <u>https://www.youtube.com/watch?v=sXKiAKn0WCM</u>
- 4. https://en.wikipedia.org/wiki/Center of mass
- 5. https://en.wikipedia.org/wiki/Moment_of_inertia
- 6. <u>https://www.toppr.com/guides/physics/system-of-particles-and-rotational-dynamics/moment-of-inertia/</u>
- 7. https://byjus.com/physics/work-energy-power/
- 8. https://www.physicsclassroom.com/class/energy
- 9. https://en.wikipedia.org/wiki/Bending_moment
- 10. <u>https://www.youtube.com/watch?v=CQGlgu-8dmA</u> (Tamil video)
- 11. https://en.wikipedia.org/wiki/Newton%27s_law_of_universal_gravitation
- 12. https://www.youtube.com/watch?v=kxkFaBG6a-A
- 13. http://hyperphysics.phy-astr.gsu.edu/hbase/rocket2.html
- 14. https://en.wikipedia.org/wiki/Global_Positioning_System
- 15. https://study.com/academy/lesson/the-global-positioning-system-and-its-uses.html
- 16. https://www.nasa.gov/centers/johnson/pdf/584739main_Wings-ch5d-pgs370-407.pdf

SEMESTER II

CORE PAPER - 2 HEAT AND THERMODYNAMICS

Course Objectives

- 1. Get clear idea about the specific heat capacity and kinetic theory of gases
- 2. Knowledge about the conduction, radiation and low temperature physicswill be gained
- 3. To know the thermodynamic system and its laws
- 4. To learn the concept of entropy and Mawell'sthermodynamical relations
- 5. To study the basic ideas of statistical mechanics

Unit-1: Specific Heat & Kinetic theory of gases

Specific heat capacity-Principle of method of mixtures-Specific heat capacity of liquid by method of mixtures-Newton's law of cooling-Specific heat capacity of a liquid by the method of cooling- Specific heat capacity of a liquid by Callender and Barne's method-Specific heat capacity of gases- Meyer's relation between C_P and C_v .

Kinetic theory of gases-Expression of pressure of gas-Boyle's law-Charle's law-Perfect gas equation- Mean free path-Expression for mean free path-Maxwell's velocity distribution law-Transport phenomena-Diffusion-Law of equipartition energy- Application to specific heat of gases.

Unit-2: Transmission of Heat & Low Temperature Physics

Conduction-Coefficient of thermal conductivity-thermal conductivity of a good conductor--Forbe's method – thermal conductivity of a poor conductor -Lee's disc method-Black body radiation-Stefan -Boltzmann law-determination of Stefan's constant -laboratory method-Solar energy-Solar cooker-solar constant- temperature of the Sun.

Joule-Kelvin effect-Porous plug experiment- liquefaction of hydrogen- liquefaction of helium-Kammerling-Onne's method-Helium I and II -Lambda point-Superconductivity-Type I and II superconductors -Meissner effect-applications of superconductors.

UNIT-3: Thermodynamics

Thermodynamic system- Zeroth law, First and Second law of thermodynamics -Carnot's theorem-Statement and proof-Otto (petrol) engine and Diesel engine –Construction, working and efficiency- Thermodynamic scale of temperature- Thermodynamic and perfect gas scale.

UNIT-4: Entropy & Enthalpy

Entropy- Change in entropy in a reversible/irreversible process-Temperature entropy diagram -Entropy of perfect gas- Third law of thermodynamics-Maxwell's thermo dynamical relations--Clapeyron latent heat equation-Clausius latent heat equation-Helmholtz and Gibb's free energy-Enthalpy.

UNIT-5:Statistical Mechanics

Phase space- Macrostate and Microstate- Entropy and Thermodynamic probability, Maxwell-Boltzmann law - distribution of velocity -Quantum statistics - Fermi-Dirac distribution law - electron gas - Bose-Einstein distribution law - photon gas - comparison of three statistics-Ensembles-Micro, canonical and grand canonical ensembles.

Text Books

Unit 1 to Unit 5

- 1. D. Jayaraman, K. Ilangovan, Thermal Physics & Stastical Mechanics, S. Viswanathan, Printers & Publishers Private Ltd, Chennai, 2016.
- 2. BrijLal and N Subrahmanyam, Heat Thermodynamics and Statistical Physics, S Chand & Company Pvt Ltd, New Delhi, 2016.

Reference Books

- 1. D.S. Mathur, Heat and Thermodynamics, S Chand & Company Pvt Ltd, 2008.
- 2. J.B. Rajam, Heat and thermodynamics, S Chand & Co., New Delhi, 1990.
- 3. R Murugeshan and KiruthigaSivaprasad, Thermal Physics, S Chand & Co., New Delhi, 2002.
- 4. Gupta and Kumar, Elements of Statistical Mechanics, PragatiPrakashan, Meerut, 2000.
- 5. SathyaPrakash and J P Agarwal , Statistical Mechanics , KedarNath& Ram Nath& Co., Meerut, 2002.

E- Materials

- 1. <u>https://www.e-booksdirectory.com/details.php?ebook=1778</u>
- 2. https://www.ugrad.math.ubc.ca/coursedoc/math100/notes/diffeqs/cool.html
- 3. https://www.youtube.com/watch?v=JLU0phEP7h4
- 4. <u>https://www.youtube.com/watch?v=Q7qzc7-flMY</u> (Tamil Video)
- 5. <u>https://www.youtube.com/watch?v=Atnjo7dD_bA</u>
- 6. <u>https://www.youtube.com/watch?v=iENG9VnBeP0</u>
- 7. http://www.iiserpune.ac.in/~bhasbapat/phy221_files/Lee's%20Method.pdf
- 8. <u>https://vikaspedia.in/energy/energy-production/solar-energy/solar-cookers</u>
- 9. <u>https://www.youtube.com/watch?v=ZWDl1-oZLJQ</u> (Tamil Video)
- 10. https://www.youtube.com/watch?v=6IRXVZKH6WQ
- 11. https://www.youtube.com/watch?v=DPjMPeU5OeM
- 12. https://statisticalphysics.openmetric.org/equilibrium/ensembles.html

Course Out Comes

1. After studied unit-1, the student will be able to know fundamentals specific heat capacity and able to explain the kinetic theory of gases.

- 2. After studied unit-2, the student will be able to describe the conduction and radiation of heat and also able to study the Joule-Kelvin effect based on the low temperature phenomena and its applications.
- 3. After studied unit-3, the student will be able to cite the laws of thermodynamics and their applications.
- 4. After studied unit-4, the student will be able to explore the equations governing second law of thermodynamics and entropy.
- 5. After studied unit-5, the student will be able to explain Phase-space, micro and macrostates and able to distinguish MB,FD and BE statistics.

CORE PRACTICAL-1

List of Experiments (Any 15 Experiments only)

- 1. Compound Pendulum -Determination of 'g' and 'k'.
- 2. Young's modulus -non uniform bending -Pin and microscope.
- 3. Young's modulus -uniform bending -Optic lever.
- 4. Young's modulus cantilever- depression- dynamic method-Mirror, Scale and Telescope.
- 5. Rigidity modulus Torsional Pendulum without masses.
- 6. Rigidity modulus and moment of inertia -Torsional Pendulum -with identical masses.
- 7. Rigidity modulus -Static torsion -Mirror, scale and telescope.
- 8. Surface tension and Interfacial surface tension drop weight method.
- 9. Coefficient of viscosity of liquid-Graduated burette -Radius of capillary tube by using microscope.
- 10. Thermal conductivity of a poor conductor -Lee's disc method.
- 11. Specific heat capacity of liquid -Newton's law of cooling.
- 12. Sonometer -Frequency of Tuning fork.
- 13. Sonometer -Relative density of a solid and liquid.
- 14. Focal length -R and μ of a convex lens [focal length i) u-v and ii) conjugate foci method; Radius of curvature by telescope method].
- 15. Focal length -R and μ of a concave lens [focal length i) in contact and ii) auxiliary lens method; Radius of curvature by Boy's method].
- 16. Spectrometer -Solid prism- Refractive indexof material of a prism.
- 17. Spectrometer- Hollow prism Refractive index of a liquid.
- 18. Potentiometer -Calibration of low range voltmeter.
- 19. Potentiometer Internal resistance of a Cell.
- 20. Post office box -Temperature coefficient of resistance of a coil.

Text Books

- 1. C.C. Ouseph, U.J. Rao, V. Vijayendran, Practical Physics and Electronics, S. Viswanathan, Printers & Publishers Private Ltd, Chennai, 2018.
- 2. M.N.Srinivasan, S. Balasubramanian, R.Ranganathan, A Text Book of Practical Physics, Sultan Chand & Sons, New Delhi, 2015.

Reference Books

- 1. Samir Kumar Ghosh, A Textbook of Advanced Practical Physics, NCBA, Kolkatta, 2000.
- 2. D. Chattopadyay, P.C.Rakshit, An Advanced Course in Practical Physics, NCBA, Kolkatta, 2011
- 3. C.L.Arora, B.Sc., Practical Physics, S. Chand and Company., New Delhi.
- 4. D.P.Khandelwal, A Laboratory Manual of Physics for Undergraduate Classes, VaniPublications.
- 5. B.Saraf et al, Physics through Experiments, Vikas Publications.
- 6. Harnaam Singh., B.Sc., Practical Physics, S. Chand and Company., New Delhi.
- 7. D C Tayal, University Practical Physics, Himalaya Publishing House.
- 8. Gupta & Kumar, Practical Physics, Pragatiprakashan, Meerut

ANNAMALAI UNIVERSITY MASTER OF SCIENCE M.Sc. Physics (2021–2022)

The Course of Study and the Scheme of Examination

SI.	SI. Study Components		ins.	Cre		Ма	ximum M	larks
No.	Course T	itle	week	dit	Title of the Paper		Uni	
	SEM					CIA	Exam	Total
	JLIV		_					
1	Core-Theory	Paper-1	5	4	Mathematical Physics - I	25	75	100
2	Core-Theory	Paper-2	5	4	Classical and Statistical Mechanics	25	75	100
3	Core-Theory	Paper-3	5	4	Quantum Mechanics - I	25	75	100
4	Core-Practical	Paper-1	4	0	General Practical	0	0	0
5	Core-Practical	Paper-2	4	0	Electronics Practical	0	0	0
	1	lr	nternal El	ective f	or same major students (Choose any one)	-	1	r
	@ Core	Paper-1			A. Electronic Devices and Applications			
6	Elective		4	3	B.Fiber Optic Communication	25	75	100
					C. Electronics Communication Systems	<u> </u>		
		External	Elective f	or othe	er major students (Inter/multi disciplinary paper	s)		
7	@ Open	Paper-1			A.Energy Physics	25	75	100
	Elective		3	3	B.Basic Physics			
			20	10				
			30	18		125	375	500
	SEM	ESTER II		•		CIA	Uni. Exam	Total
8	Core-Theory	Paper-4	5	4	Mathematical Physics - II	25	75	100
9	Core-Theory	Paper-5	5	4	Electro Magnetic Theory	25	75	100
10	Core-Theory	Paper-6	4	4	Quantum Mechanics - II	25	75	100
11	Core-Practical	Paper-1	4	4	General Practical	25	75	100
12	Core-Practical	Paper-2	4	4	Electronics Practical	25	75	100
		lr	nternal El	ective f	or same major students (Choose any one)			
	Coro				A.Nanoscience			
13	Flective	Paper-2	3	3	B.Electronics Instrumentation	25	75	100
	LICCLIVE				C. Non- linear optics			
		External	Elective f	or othe	er major students (Inter/multi disciplinary paper	s)	-	
14	Open Elective	Paper-2			A.Spectroscopy and Lasers			
			3	3	B. Physics for Competitive Exams	25	75	100
					C. Analog and Digital Electronics			
15	*Field Study		-	2		100	-	100
16	Compulsory Pa	per	2	2	Human Rights & Duties	25	75	100
			30	30		300	600	900

* Field Study

There will be field study which is compulsory in the first semester of all PG courses with 2 credits. This field study should be related to the subject concerned with social impact. Field and Topic should be registered by the students in the first semester of their study along with the name of a mentor before the end of the month of August. The report with problem identification and proposed solution should be written in not less than 25 pages in a standard format and it should be submitted at the end of second semester. The period for undergoing the field study is 30 hours beyond the instructional hours of the respective programme. Students shall consult their mentors within campus and experts outside the campus for selecting the field and topic of the field study. The following members may be nominated for confirming the topic and evaluating the field study report.

- (i). Head of the respective department
- (ii). Mentor
- (iii). One faculty from other department

ANNAMALAI UNIVERSITY M.Sc. Physics

CORE PAPER-1

Name of the course/subject:	M.Sc Physics	Semester: I
Name of the Paper: Mathemat	Credits:4	
Hours of teaching:5	Paper type: Core	

Course Objectives

- 1. To acquire the knowledge about linear vector spaces and matrices.
- 2. To learn the new aspects of tensors.
- 3. To teach the concept of differential equations.
- 4. To impart the knowledge about special functions.
- 5. To study the fundamentals of Dirac-Delta and Green's functions.

UNIT-1: Linear Vector Spaces and Matrices

Linear Vector Spaces explanation- Examples of linear vector spaces-Linear independence of vectors and dimension – Basis and expansion theorem-Inner products and unitary spaces-Orthonormal sets- Schwarz inequality -Schmidt orthogonalization process- Solved examples-Matrices-Linear transformation-Orthogonal, unitary and similarity transformation-Eigen values, Eigen vectors-Characteristic equation of a matrix-Caley-Hamilton theorem with proof.

UNIT-2: Tensors

Introduction-Coordinate transformation– Indical and summation convention – Dummy and real indices-Kronecker delta symbol-Scalars, Contravariant, Covariant tensors – Tensors of higher ranks-Algebraic operations of Tensors-Addition and subtraction-Contraction of tensors-Inner product-Quotient law-Statement and example- Symmetric and anti-symmetric tensors - Invariant tensors -Levi-Civita Symbol.

UNIT-3: Differential Equations

Order and Degree of a differential equation-Linear differential equation of first order and its solution-Solution of Second order differential equation with constant coefficients- Singular points of differential equations-Self adjoint differential equation-Power series solution-Frobenius' method.

UNIT-4: Special Functions

Special functions – Legendre differential equation and polynomials-Generating functions--Recurrence formulae- Rodrigue's formula for Legendre polynomials-Orthogonal properties of Legendre polynomials- Bessel differential equation and polynomials-Generating functions-Recurrence formulae- for Bessel polynomials-Orthogonality of Spherical BesselfunctionsHermiteDifferential equation and Polynomials-Generating function of Polynomials-Recurrence formulae-Rodrigue's formula for Hermite polynomials-Orthogonal properties of Hermite polynomialsLaguerre -Differential equation and Polynomials-Generating function of Polynomials-Recurrence formulae-Rodrigue's formula for Laguerre polynomials-Orthogonal properties of Laguerre polynomials.

UNIT-5: Dirac-Delta and Green's Functions

Dirac-Delta function-Properties of Delta function-Fourier and Laplace transform of Delta Function- Green's function Introduction- Green's function for one-dimensional case (solution of Sturm-Liouville equation)-Symmetry property of Green's function-Eigen function - expansion of the Green's function-Green's function for Three dimensional Helmhotz equation.

Text Books

Unit -I to Unit -V

1. Satyaprakash, Mathematical Physics with Classical Mechanics Sultan Chand & sons, New Delhi, 2016.

Reference Books

- 1. P.K. Chattopadhyay, Mathematical Physics, New Age International Publishers, New Delhi, 2016.
- 2. B.S. Rajput, Mathematical Physics, PragatiPrakashan, Meerut, 2009.
- 3. H.K. Dass, Dr. Rama Verma, Mathematical Physics, New Delhi, 2014.
- 4. B.D. Gupta, Mathematical Physics, Vikas publishing house 3rd Edition, New Delhi, 2006.
- 5. Schaum's Outline Series, (i) Vector and tensor analysis, (ii) Linear Algebra, (iii) Matrices, (iv) Differential Equations

E-Materials

- 1. <u>http://web.mst.edu/~hale/courses/M402/M402_notes/M402-Chapter1/M402-Chapter1.Fall13b.pdf</u>
- 2. <u>https://www.youtube.com/watch?v=eeMJg4uI7o0</u>
- 3. <u>https://www.youtube.com/watch?v=v02D7C7js3g</u>
- 4. https://www.youtube.com/watch?v=adXPC4HC6ck
- 5. https://www.youtube.com/watch?v=xNqLZnM-PPY
- 6. <u>http://electron6.phys.utk.edu/qm1/modules/m4/Vector_space.htm</u>
- 7. <u>https://en.wikipedia.org/wiki/Tensor</u>
- 8. <u>https://www.youtube.com/watch?v=uaQeXi4E7gA</u>
- 9. <u>https://www.grc.nasa.gov/www/k-</u> <u>12/Numbers/Math/documents/Tensors_TM2002211716.pdf</u>
- 10. http://www.physics.wm.edu/~finn/home/MathPhysics.pdf

Course Outcomes

- 1. After studied unit-1, the student will be able to explain linear vector spaces and matrices and can solve the problems.
- 2. After studied unit-2, the student will be able to describe tensors in detail.
- 3. After studied unit-3, the student will be able to solve the differential equations.
- 4. After studied unit-4, the student will be able to formulate the differential equations for special functions.
- 5. After studied unit-5, the student will be able to understand Dirac-Delta function, Introduction on Green functions and Green's function for one dimensional and three dimensional cases.

CORE PAPER-2

Name of the course/subject:	M.Sc Physics	Semester: I
Name of the Paper: Classical	and Statistical Mechanics	Credits: 4
Hours of teaching: 5		Paper type: Core

Course Objectives

- 1. To make learning of Classical Mechanics interesting and interesting
- 2. To teach and understand the Lagrangian and Hamiltonian formalisms and study their applications in mechanical systems and solving of problems.
- 3. To teach the theory of small oscillations and the Hamilton Jacobi
- 4. To teach and impart the knowledge associated with Rigid body dynamics
- 5. To teach Thermodynamics and Classical Statistics
- 6. To introduce Quantum Statistics and explain the theoretical backgrounds
- 7. To review the fundamental concepts of thermodynamics and to create an understanding of the principles of classical and quantum Statistical Mechanics and their applications.

UNIT-1: Lagrangian and Hamiltonian formalisms and canonical transformation

Lagrangian formalism: Constrains-classification-D-Alembert's principle-Lagrange's equation from D-Alembert's principle- Applications: Spherical pendulum,Cylinder rolling down an inclined plane.

Hamiltonian formalism: Cyclic coordinates and conservation theorem - Hamilton's equations –Hamilton's variational principle-Hamilton's equation of motion fromvariational principle-Applications:Linear harmonic oscillator and projectile in space.

Canonical transformations: Generating function- condition for a function to be canonicalsimple example-Poisson's brackets-properties-Hamilton's equation of motion in Poisson's bracket-invariance of Poisson's bracket under canonical transformation.

UNIT-2: Hamilton - Jacobi Theory and Theory of Small Oscillations

Hamilton-Jacobi equations:Hamilton's characteristic function- Application to Linear harmonic oscillator problem - Action Angle variables –Action angle variable in a system of one degree of freedom-Application to Kepler's problem - Oscillatory motion: Theory of small oscillation - Linear triatomic molecule - Stability of Oscillatory motion - Forced Harmonic Oscillator.

UNIT-3: Rigid body dynamics

Rigid body motion: Degrees of freedom-independent coordinates-Orthogonal transformation-Euler's angles - Angular momentum and kinetic Energy – Moment of inertia tensor - Euler's equations of motion-Torque-free motion of a rigid body - Motion of a symmetrical top under the action of gravity -Precession and nutation.

UNIT-4: Thermodynamics and Classical statistics

Thermodynamic parameters – Thermodynamic potentials – Gibbs phase rule – First and second order phase transitions –Entropy – fluctuations and irreversible process - Random walk - Brownian motion - Langevin theory.

Classical Statistics: Postulates - Maxwell Boltzmann distribution- application to diatomic molecule - Phase space - ensembles - Micro Canonical, Canonical and Grand Canonical ensembles -Liouville theorem and its significance- Partition function and its thermo dynamical properties - Translational partition functions - Gibb's Paradox - Sackur- Tetrode equation.

UNIT-V: Quantum Statistics

Quantum Statistics of ideal gas - Ideas of Bose – Einstein-Bose-Einstein condensation of gases – liquid helium- Fermi-Dirac distribution- Degeneracy of gases - - Photon gas - Planck's law of radiation and its limitation - Thermionic emission - Pauli's theory of Para magnetism.

Text Books

Unit-1

- 1. SathyaPrakash and J.P Agarwal, Statistical Mechanics, 7th Edition, KedarNath and Ram Nath& Co, Meerut, 1994.
- 2. J.K.Bhattacharjee, Statistical Mechanics: An Introductory Text, Allied Publication, New Delhi, 1996.

Unit-2

- 1. Gupta Kumar Sharma, Classical Mechanics, PragatiPrakashan, Meerut, 2004.
- 2. SathyaPrakash and J.P Agarwal, Statistical Mechanics, 7th Edition, KedarNath and Ram Nath& Co, Meerut, 1994.
- 3. J.K.Bhattacharjee, Statistical Mechanics: An Introductory Text, Allied Publication, New Delhi, 1996.

Unit-3

- 1. SathyaPrakash and J.P Agarwal, Statistical Mechanics, 7th Edition, KedarNath and Ram Nath& Co, Meerut, 1994.
- 2. J.K.Bhattacharjee, Statistical Mechanics: An Introductory Text, Allied Publication, New Delhi, 1996.

Unit-4

- 1. S.N. Biswas, Classical Mechanics, Books and Allied Ltd., Kolkata, 1998.
- 2. Upadhyaya, Classical Mechanics, Himalaya Publishing Co., New Delhi, 1999.
- 3. Gupta Kumar Sharma, Classical Mechanics, PragatiPrakashan, Meerut, 2004.

Unit-5

- 1. B.K. Agarwal and M. Eisner, Statistical Mechanics, 2nd Edition, New Age International, New Delhi, 1998.
- 2. SathyaPrakash and J.P Agarwal, Statistical Mechanics, 7th Edition, KedarNath and Ram Nath& Co, Meerut, 1994.

Reference Items: books, Journal

- 1. H. Goldstein, Classical Mechanics. 3rd Edition. Pearson Education, Asia, New Delhi, 2002.
- 2. K. Huang, Statistical Mechanics, Wiley Eastern Ltd., New Delhi, 1975.
- 3. L.D. Landau and E.M. Lifshitz, Mechanics, Pergomon Press, Oxford, 1969.
- 4. K.R. Symon, Mechanics, Addison Wesley, London, 1971.
- 5. J.L. Synge and B.A Griffith, Principles of Classical Mechanics, Mc.Graw-Hill, NewYork, 1949.
- 6. C.R.Mondal, Classical Mechanics, Prentice Hall of India, New Delhi.
- 7. L.P. Kadanoff, Statistical Physics Statics, Dynamics and Renormalization, World Scientific, Singapore, 2001.
- 8. M. Glazer and J. Wark, Statistical Mechanics, Oxford University Press, Oxford, 2001.

E- Materials

- 1. <u>http://www.freebookcentre.net/physics-books-download/Notes-On-Statistical-Mechanics-by-K.P.N.-Murthy.html</u>
- 2. <u>http://www.freebookcentre.net/physics-books-download/Statistical-Mechanics-by-Henri-J.F.-Jansen.html</u>
- 3. <u>http://www.freebookcentre.net/physics-books-download/Lecture-Notes,-Statistical-Mechanics.html</u>
- 4. <u>http://www.freebookcentre.net/physics-books-download/Classical-Mechanics-Lecture-Notes-byTom-Kirchner.html</u>
- 5. <u>http://www.atmosp.physics.utoronto.ca/~shahnas/Courses/Classical_Mech_Grad/Classical_Mech_Grad_Chap01.pdf</u>
- 6. <u>http://www.freebookcentre.net/physics-books-download/Classical-Mechanics-by-Eric-D-Hoker.html</u>
- 7. <u>http://hyperphysics.phy-astr.gsu.edu/hbase/quantum/disfd.html</u>
- 8. <u>https://www.youtube.com/watch?v=fdS12EaXH3A</u>
- 9. <u>https://www.youtube.com/watch?v=rDHQ60CXDbU</u>
- 10. https://en.wikipedia.org/wiki/Statistical_ensemble_(mathematical_physics)

Course Outcomes

1. After studying unit-1, the student will

havedepth knowledge about Lagrangian and solve problems in mechanical systems using Lagrangian formulation.

Understand conservation theorems and its relevance in classical formulation. Learn Hamiltonian formulations and solve problems using Hamiltonian formulation. 2. After studying unit-2, the student will be able to

Apply Hamilton's characteristic function to solve problems Understand Action Angle variables and solve one degree of freedom and Kepler's problem

Acquire knowledge about oscillatory motion and stability of oscillatory motion

3. After studying unit-3, the student will

have knowledge about fundamentals of rigid body motion. Explain Moment of inertia tensor. Derive and solve Euler's angles Euler's equations of motion. Able to solve problems on force free motion of a rigid body and symmetrical top.

4. After studying unit-4, the student will be able to

Explain different statistical ensembles, their distribution functions, ranges of applicability and the corresponding thermodynamic potentials.

Calculate basic thermo dynamical quantities in classical and quantum statistical models.

Understand and solve problems on partition and translational partition function.

5. After studying unit-5, the student will be able to

Apply quantum distribution laws and solve Bose-Einstein condensation of gases and Photon gas.

Signify the results of Planck's law of radiation and its limitation.

Explain Thermionic emission and Pauli's theory of Para magnetism.

CORE PAPER-3

Semester: I
its: 4
Paper type: Core
••••••

Course Objectives

The primary objective is to teach the students the physical and mathematical basis of quantum mechanics for non-relativistic systems

UNIT-1:Basic formalism

Schrodinger equation – Max Born's interpretation of wave function – Normalisation, scattering states and bound states – admissibility conditions for a quantum mechanical wave function – Equation of continuity and conservation of probability – Time independent Schrodinger equation – stationary eigen states – particle in a box – square well potential – Rectangular potential Barrier – tunnelling.

UNIT-2: Abstract formulation of Quantum Mechanics

Mathematical properties of linear vector spaces – Dirac's bra and ket notation – Hermitian operators, eigenvalues and eigenvectors – Postulates of quantum mechanics. Position and momentum representations, connection with wave mechanics – Commuting operators – Generalised uncertainty principle. Change of basis and unitary transformation. Expectation values – Ehrenfest theorem.

UNIT-3: Quantum Dynamics

Schrodinger picture – Heisenberg picture – Heisenberg equation of motion, Classical limit. Solution of simple harmonic oscillator problem by the operator method – General view of symmetries and conservation laws.

UNIT-4: Symmetries in Quantum Mechanics

Hydrogen like atoms and spherical harmonics – Spatial translation, continuousand discrete, Time translation – Parity – Time reversal – Density matrices - properties, pureand mixed density matrices, expectation value of an observable, time-evolution, reduceddensity matrix

UNIT-5: Angular Momentum

Cmmutation relations of angular momentum operators – Eigenvalues, eigenvectors – Ladder operators and their matrix representations – Addition of angular momenta, Clebsch-Gordan coefficients – Wigner-Eckart theorem.

Text Books

Unit 1 to Unit 5

- 1. P. M. Mathews and K. Venkatesan, 1976, A Text book of Quantum Mechanics, Tata McGraw-Hill, New Delhi.
- 2. L. I. Schiff, 1968, Quantum Mechanics, 3rd Edition, International Student Edition, MacGraw-Hill Kogakusha, Tokyo.
- 3. V. Devanathan, 2005, Quantum Mechanics, Narosa Publishing House, New Delhi.
- 4. G. Aruldhas, 2002, Quantum Mechanics, Prentice Hall of India, New Delhi.
- 5. A. Ghatak and S. Lokanathan, Quantum Mechanics: Theory and Applications, 4th Edition, Macmillan India.

Reference Books

- E. Merzbacher, 1970, Quantum Mechanics 2nd edition, John Wiley and Sons, New York.
 V. K. Thankappan, 1985, Quantum Mechanics, 2nd Edition, Wiley Eastern Ltd, New Delhi.
- 3. P. A. M. Dirac, 1973, The Principles of Quantum Mechanics, Oxford University Press, London.
- 4. L. D. Landau and E. M. Lifshitz, 1976, Quantum MechanicsPergomon Press, Oxford.
- 5. S. N. Biswas, 1999, Quantum Mechanics, Books And Allied Ltd., Kolkata.
- 6. J. S. Bell, Gottfried and M.Veltman, 2001, The Foundations of Quantum Mechanics World Scientific, Singapore.
- 7. R. P. Feynman, R. B. Leighton, and M. Sands, 1998, The Feynman Lectures on Physics, Vols. 3, Narosa, New Delhi.
- 8. J.J. Sakurai, Modern Quantum Mechanics, Addison-Wesley, 1993

E-Materials

- 1. http://www.netsa.org.lk/OcwWeb/Physics/index.htm
- 2. http://www.theory.caltech.edu/people/preskill/ph229/
- 3. http://www.nscl.msu.edu/~pratt/phy851/lectures/lectures.html
- 4. http://walet.phy.umist.ac.uk/QM/LectureNotes/
- 5. http://www.ks.uiuc.edu/Services/Class/PHYS480/
- 6. http://www.mat.univie.ac.at/~gerald/ftp/book-schroe/index.html
- 7. http://people.deas.harvard.edu/~jones/ap216/lectures/lectures.html
- 8. http://www.netsa.org.lk/OcwWeb/Chemistry/5-73Introductory-Quantum-Mechanics-IFall2002/LectureNotes/index.htm
- 9. http://www.glue.umd.edu/~fivel/

Course Outcomes:

- 1. The interpretation of wave function of quantum particle and quantum theory formulation is introduced through Schrodinger equation, student gets exposed to the behaviour of quantum particle encountering a i) barrier, ii) potential well.
- 2. Understand the general formulation of quantum mechanics which deal with the abstract object such as kets, bras, and operators.
- 3. Acquire knowledge about unitary transformation and able to analyse Schrodinger and Heisenberg interaction pictures.
- 4. Gain the knowledge of solving non-relativistic hydrogen atom, expectation value and density matrix.
- 5. Gain the knowledge about spin, angular momentum states, addition rules and identical particles.
ANNAMALAI UNIVERSITY COREELECTIVEPAPER- 1 (to choose 1 out of 3)

Name of the course/subject:M.Sc PhysicsSemester: IName of the Paper: A. Electronics Devices & ApplicationsCredits:3Hours of teaching: 4Paper type: Core Elective

Course Objectives

- 1. To introduce structures, physical operations and circuit applications of basic semiconductor devices and display devices.
- 2. To develop the ability to analyse and design electronic circuits and to grasp the basic ideas of op-amps and its applications.
- 3. To provide an exposure to the wide applications of logic families, optoelectronic devices, Operational amplifiers, 555 Timer and Phase Locked Loops.
- 4. To study the basics of transducers and its types.
- 5. To familiarize the basic principles and advantages of pulse and digital communications.

UNIT-1: Logic families and Opto electronic devices

Logic Families: TTL Inverter-TTL NAND - P MOS-N MOS-CMOS and I2L logics (Inverter and NAND)

Opto electronic devices: Light emitting diode - Surface emitting LED - Edge Emitting LED -Seven segment display - LDR - Photo diode - p-i-n Photo diode - Photo transistors - Solar cells – Photo detectors: IR and UV detectors.

Unit-2: OP-AMP Applications

Op-amp - characteristics - Difference amplifier - CMRR - Integrator - differentiator - comparator- Zero crossing detector- Log and Antilog amplifier-Multiplier and divider-Instrumentation amplifier - V to I and I to V converters - Sample and Hold circuits-Electronic analog computation: Solving Simultaneous equations and Second order differential equations.

UNIT-3: 555 Timer and Phase Locked Loop

555 Timer - Description - Monostable operation - Applications: Pulse width modulator-Frequency divider - Astable operation - Applications: Schmitt trigger - FSK generator. Phase Locked Loops: - PLL IC 565 - Description - Lock-in range - capture range - pull-in time (Basic principles) - Applications: Frequency multiplication and Translation.

UNIT-4: Transducers

Classification of Transducers - Principle, construction and working of Thermistor - LVDT, Electrical strain gauges and capacitive transducers, Photoelectric transducer, Piezoelectric transducer – Photovoltaic transducer, Photo emissive transducer, Measurement of non-

electrical quantities - Strain, Displacement, temperature, Pressure, Magnetic fields, vibration, optical and particle detectors.

UNIT-5: Pulse and digital Communication

Pulse communications - Modulation and Demodulation: Pulse Amplitude Modulation (PAM) - Pulse Time Modulation (PTM): Pulse Width Modulation (PWM) - Pulse Position Modulation (PPM) - Pulse Code Modulation (PCM) - Quantizing noise- Frequency-Shift keying- Digital communication - Advantages of digital communication - Modem classification - Modes of modem operation - Modem interconnection - Modem interfacing.

Text Books

Unit 1 and Unit 3

- 1. V. Vijayendran, Introduction to Integrated Electronics: Digital and Analog, Third Reprint, S.Viswanathan (Printers &Publishers), PVT., Ltd, 2007.
- 2. J. Millman and C.Halkias, Integrated Electronics, New Delhi, Tata McGraw Hill, 2001.

Unit 2

- 1. D. Roy Choudhury.D and ShailB.Jain, Linear Integrated Circuits, 4th edition, New AgeInternational (P) Ltd, Chennai, 2010.
- 2. George Kennedy, Electronic Communication systems, 3rd Edition, McGraw Hill, London 1987.

Unit-4

- 1. Dr.Rajendra Prasad, Electronic Measurements and Instrumentation, Khanna Publications.
- 2. S.Ramabhadran, Electronic Measurements and Instrumentation Khanna Publications.

Unit-5

- 1. Pallab Bhattacharya, Semiconductor Optoelectronic devices, Second Edition, Pearson Education, New Delhi, 2001.
- 2. D. Roy Choudhuryand ShailB.Jain, Linear Integrated Circuits, 4th edition, New Age International (P) Ltd, Chennai, 2010.

Books for Reference

- 1. C. Sarkar, D.C.Darkar, Optoelectronics and Fibre Optics communication, New Delhi, New Age International Publishers, 2006.
- 2. M.S.Tyagi, Introduction to Semiconductor Devices, Wiley, New York.
- 3. Ramakant A. Gayakwad, Op-Amps and Linear Integrated Circuits, Third Edition, Prentice Hall India, New Delhi,1997.
- 4. R.F. Coughlin and F.F, Driscol, Op-Amp and linear integrated circuits, Prentice Hall of India, New Delhi, 1996.
- 5. Louis E. Fresnel, Communication Electronics : principles and Applications, TMH Pub. Co., Ltd, 2002.

- 6. Wayne Tomasi, Electronic communication Systems, Fifth Edition, New Delhi, Pearson education, Inc, 2011.
- Donald P Leach, Albert Paul Malvino and GoutamSaha, Digital Principles and Applications, Sixth Edition, Tata McGraw-Hill publishing company Ltd, New Delhi, 2008.
- 8. Allen Mottershead, Electronic devices and circuits, Prentice Hall India, New Delhi, 2000.

E-Materials

- 1. <u>https://www.iare.ac.in/sites/default/files/lecture_notes/IARE_ECE_EDC%20NOTES.</u> <u>pdf</u>
- 2. <u>https://www.researchgate.net/publication/275408225_Electronic_Devices_and_Circui</u> <u>ts</u>
- 3. <u>https://www.researchgate.net/publication/312190335_Fundamentals_of_Electronic_D</u> evices_Circuits_from_A_to_Z
- 4. http://engineering.nyu.edu/gk12/amps-cbri/pdf/Basic%20Electronics.pdf
- 5. <u>http://www.ece.mtu.edu/faculty/ljbohman/onlinetext/elapp200.pdf</u>
- 6. https://en.wikipedia.org/wiki/Transducer
- 7. <u>https://www.youtube.com/watch?v=PTENYoZF9fA</u>
- 8. https://www.youtube.com/watch?v=VMBGtCS2EGg
- 9. <u>https://www.tutorialspoint.com/principles_of_communication/principles_of_communi</u> <u>cation_analog_pulse_modulation.htm</u>
- 10. <u>https://www.elprocus.com/pulse-amplitude-modulation/</u>

Course Outcomes

1. After studying unit-I, the students will be able to:

understand the characteristics and significance of logic families Identify different types of logic families describe fundamental and applied aspects of optoelectronic device physics and its applications to the design and operation of laser diodes, light-emitting diodes, and photo detectors

- 2. After studying unit-II, the students will be able to:
 - understand the significance of Op-amps and their importance understand various linear/non-linear applications to solve simultaneous equations and second order differential equations
- 3. After studying unit-III, the students will be able to: understand about the 555 timer and applications explain the working of multivibrators using IC 555 Illustrate the function of application of PLL and its applications
- 4. After studying unit-IV, the students will be able to: Know the principle and working of transducers explaindifferent types of transducers
- 5. After studying unit-V, the students will be able to: able to compare different modulation schemes with their advantages, disadvantages and applications.

Use modulation and demodulation techniques in analog and digital communications able to understand the concept of MODEM and MODEM interfacing

ANNAMALAI UNIVERSITY

CORE ELECTIVEPAPER-1 (to choose 1 out of 3)

Name of the course/subject:M.Sc Physics	Semester: I
Name of the Paper: B. Fiber Optic Communic	eation Credits: 3
Hours of teaching: 4	Paper type: Core Elective

Course objectives

- 1. To understand the concept of electromagnetic waves and formulate the Maxwell's equations.
- 2. To acquire the basic knowledge about optical fiber and waveguides
- 3. To study the different types of optical fiber and it characteristics
- 4. To teach the fabrication and connection of optical fibers
- 5. To learn the nonlinear effects in fiber and solitons

UNIT-1: Linear, nonlinear waves and Maxwell's equations

Simple pendulum – small and large oscillations – Duffing oscillator – Linear and nonlinear medium - Maxwell's equations – Electromagnetic waves phase and group velocity, modes in a planar and cylindrical wave guides – polarization - dielectric susceptibility – first and higher order susceptibilities.

UNIT -2: Optical fiber waveguides and sources

Ray theory transmission: Total internal reflection, acceptance angle, numerical aperture and skew rays -- evanescent field and Goos-Haechen shift - step index and graded index fibers - single and multi-mode fibers.

Sources:LED - Lasers – mode locked Lasers - modulation capability- transient response - semiconductor losses - diode structure and threshold conditions – modulation – temperature effects – source linearity and reliability – Photo detectors – PIN Photo detector – avalanche photodiode.

UNIT -3: Transmission characteristics of optical fibers

Attenuation – material absorption losses in silica fibers – linear and nonlinear scattering losses – fiber bend loss – mid-infrared and far-infrared transmission – intramodal and intermodal dispersion – overall fiber dispersion in multimode and single-mode fibers – modal birefringence.

UNIT-4: Fabrication and connection of optical fibers

Glass fibers - Preparation of optical fibers – Liquid-phase (melting) and Vapour-phase deposition techniques – characteristics of single-mode, multimode, plastic-clad and all-plastic fibers - Stability of the Fiber Transmission Characteristics: Micro bending and hydrogen absorption – fiber alignment and joint loss – fiber splices – Fiber connectors: cylindrical ferrule expanded beam connectors - Fiber couplers: Three and four port couplers - star couplers.

UNIT-5: Nonlinear effects in fiber and solitons in optical fiber communication

Refractive index – frequency and intensity dependent refractive index – group velocity dispersion – self-phase modulation - Kerr effect – chirping - stimulated Raman scattering – stimulated Brillouin scattering – self-steepening – self-focusing – self-defocusing – concept of solitons – formation of solitons – kdV equation - Nonlinear Schrödinger equation for solitons – soliton switching – soliton laser- advantages of soliton based communication.

Text Books

Unit 1 to Unit 5

- 1. AjoyGhatak and K. Thyagarajan, Introduction to fiber optics, 6th Edition, Cambridge University press, 2006.
- 2. John M. Senior, Optical fiber communications: Principles and practice, 2ndedition, PHI.
- 3. Govind P. Agrawal, Fiber-Optic communication systems, John Wiley, 2003.
- 4. Waves called Solitons: concepts and experiments, Springer Verlag, 1992.
- 5. Gerd Keiser, Optical fiber communications,5th edition, McGra-Hill Education Pvt. Ltd., New Delhi, 2013.

Reference Books

- 1. B.B. Laud, Lasers and Non-Linear optics, New Age International, New Delhi.
- 2. Akira Hasegawa and Yujiodama, Solitons in optical communications, oxford Press, 1995.
- 3. Robert W Boyd, Nonlinear fiber optics, 2nd Edition, Elsevier, 2006.

- 1. <u>http://www.fibersystems.com/pdf/whitepapers/Basics-of-Fiber-Optics.pdf</u>
- 2. <u>https://en.wikipedia.org/wiki/Maxwell%27s_equations</u>
- 3. <u>https://optiwave.com/optibpm-manuals/bpm-introduction-to-optical-waveguides</u>
- 4. http://optic1999.tripod.com/chapter3.htm
- 5. <u>https://www.quora.com/What-are-the-different-methods-of-optical-fibre-fabrication-techniques</u>
- 6. <u>http://what-when-how.com/fiber-optics/nonlinear-effects-in-optical-fibers-part-1</u>
- 7. <u>https://en.wikipedia.org/wiki/Soliton_(optics)</u>
- 8. https://www.youtube.com/watch?v=635Ip6NWnfk
- 9. https://arxiv.org/ftp/arxiv/papers/1111/111.5226.pdf
- 10. <u>https://www.youtube.com/watch?v=QB1ns1WdzYI</u>

Course Outcomes

- 1. After studied unit-1, the student will be able to explain basics and electromagnetic wave and can derive the Maxwell's equations.
- 2. After studied unit-2, the student will be able to describe waveguides and sources
- 3. After studied unit-3, the student will be able to demonstrate the different characteristic of optical fibers
- 4. After studied unit-4, the student will be able to design the fabrication and connection of optical fibers.
- 5. After studied unit-5, the student will be able to understand nonlinear effects in fibers and solitons and applications.

CORE ELECTIVEPAPER -1 (to choose 1 out of 3)

Name of the course/subject:M.Sc PhysicsSemester: IName of the Paper:C. Electronics Communication SystemCredits: 3Hours of teaching: 4Paper type: Core Elective

Course Objectives

- 1. To Understand the Signal coding Techniques
- 2. To learn the coding and Error Techniques of different control system
- 3. Students can get the depth Knowledge of Satellite Communication system like GEO, MEO etc.
- 4. To teach the basics concept of Cellular communication System
- 5. To acquire the basic knowledge of Local area networks communication system

UNIT-1: Signal Encoding Techniques

Antennas: types-Propagation modes – line of sight transmission- fading in the mobile environment – signal encoding techniques: criteria- ASK – FSK – BFSK – MFSK – PSK – BPSK – QPSK –multilevel PSK – AM modulation – Angle modulation – PCM – delta and adaptive delta modulation.

UNIT-2: Coding and Error Control

Error detection – Parity check – cycle redundancy check – block error correction codes – hamming code – cyclic codes – BCH code – reed – Solomon codes – block interleaving – convolution codes – decoding – turbo coding – automatic repeat request – flow control – error control.

UNIT-3: Satellite Communication

Satellite parameters and configurations – Satellite orbits – GEO – MEO – LEO – frequency bands – transmission impairments – Satellite foot print – atmospheric attenuation – satellite network – configuration – capacity allocation – multiplexing : FDM and TDM.

UNIT-4:Cellular wireless networks

Principles of cellular networks : Organization – frequency reuse – operation – mobile radio propagation effects – hand-off – power control – traffic engineering – first generation analog – AMPS – second generation – TDMA – mobile wireless TDMA design consideration – CDMA – mobile wireless CDMA design considerations – Soft handoff –IS 95 – Third generation systems – wireless local loop.

UNIT-5: Wireless LANS

Overview: Wireless LAN applications, requirements and technology – Infrared LANS – spread spectrum LANS – narrow band microwave LANS – IEEE 802 architecture – IEEE 802.11 architecture.

Text Books

Unit 1to Unit 5

- 1. William Schweber, Electronic Communication Systems, Complete Course Pearson Pub, 2011.
- 2. George Kennedy, Electronic Communication Systems, 3 rd Edition, Tata McGrawHill Edition, New Delhi, 2008.

Reference books

- 1. William Stallings, Wireless communications and Networks, Pearson education, Asia, 2002.
- 2. Robert J. Schoen beck, Electronic communications, modulation and transmission PHI, 1999.
- 3. P. Gnanasivam, Telecommunication switching and networks, PHI, 2004.

E-Materials

- 1. <u>https://www.youtube.com/watch?v=mSrdM0vUNRw</u>
- 2. <u>https://en.wikipedia.org/wiki/Antenna_types</u>
- 3. <u>https://en.wikipedia.org/wiki/Error_detection_and_correction</u>
- 4. <u>https://www.youtube.com/watch?v=9ftH_6uCEhU</u>
- 5. <u>https://www.youtube.com/watch?v=Samc3ce6Fsw</u>
- 6. http://www.swiftutors.com/types-of-satellite-orbits.html
- 7. https://electronics.howstuffworks.com/cell-phone7.htm
- 8. <u>https://www.youtube.com/watch?v=oYRMYSIVj1o&vl=pt-BR</u>
- 9. <u>https://www.youtube.com/watch?v=r6yDbRCIS78</u>
- 10. https://en.wikipedia.org/wiki/Wireless_LAN

Course outcomes

- 1. After studied unit-1, the student will be able to know the principle of antenna and its types.
- 2. After studied unit-2, the student will be able to explain error detection, parity check etc.
- 3. After studied unit-3, the student will be able to understanding the satellite the principle of GEO,MEO and LEO.
- 4. After studied unit-4, the student will be able to learn the cellular networks like TDMA.
- 5. After studied unit-5, the student will be able to know the wireless LAN applications and its types.

OPEN ELECTIVEPAPER-1 (to choose 1 out of 3)

Name of the course/subject:M.Sc PhysicsSemester: IName of the Paper:A. Energy PhysicsCredits: 3Hours of teaching: 3Paper type: Open Elective

Course objectives

- 1. Ability to know the power potential of the sun and its utility.
- 2. Understanding the experimental procedure of collecting solar energy.
- 3. Knowing various types of storage methods involving.
- 4. Knowing the other alternative sources for energy production.
- 5. Applying knowledge to fabricate solar cells for energy storage purpose.
- 6. Knowing other forms of energy which are existing in the nature.

UNIT-1: Solar - Thermal Conversion

An overview of thermal application and solar radiation – energy alternatives – devices for thermal collection and storage – thermal applications – Water heating – Space heating – Power generation – instruments for measuring solar radiation and sun shine

UNIT-2: Performance of Flat-Plate Collectors

Performance analysis - -Transmissivity of the cover system based on reflection - Refraction - Absorption - Transmissivity for diffuse radiation - Transmissivity - Absorptive product

UNIT-3: Concentrating Collectors and Energy Storage

General characteristics - Definitions - Methods of classifications – Thermal energy storage - Sensible heat storage - Liquids - Solids - Latent heat storage - Thermal chemical storage

UNIT-4: Photo Conversion

Photovoltaic conversion - Single crystal silicon cell - Principle and working insular cells -Conversion efficiency - Single crystal silicon – Polycrystalline and amorphous silicon -Cadmium sulphide - Cadmium telluride – copper Indium di-selenide

UNIT-5: Other Forms of Energy

Wind energy - Recent developments - Energy from biomass - Direct methods - Indirect methods \sim Wave energy - Vegetation for fuel - Bio-diesel - Plants for Bio-diesel- Physical and chemical properties of Bio-diesel .

Text Book

1. P. Sukhatme, Solar energy (Second edition), Tata McGraw-Hill Publishing Co. Ltd. (New Delhi)

Reference Book

1. G.D.Rai, Solar Energy Utilization, Khanna publishers (New Delhi)

E-Materials

- 1. https://www.nrel.gov/docs/legosti/old/1846.pdf
- 2. https://www.e-education.psu.edu/eme811/node/730
- 3. https://www.newport.com/n/photovoltaic-energy-conversion
- 4. https://www.youtube.com/watch?v=qOyc3p0OmSg
- 5. http://www.iraj.in/journal/journal_file/journal_pdf/2-129-143080175869-74.pdf
- 6. <u>https://www.youtube.com/watch?v=wvl0QAQCJyc</u>
- 7. <u>https://www.youtube.com/watch?v=BL34OwuUrBU</u>
- 8. <u>https://www.youtube.com/watch?v=oos7fETc2OE</u>
- 9. https://en.wikipedia.org/wiki/Biomass
- 10. https://physicsworld.com/a/biomass-energy-green-or-dirty/

Course Outcomes

- 1. After studied unit-1, the student will be able to explain thermal conversion
- 2. After studied unit-2, the student will be able to describe performance of flat-plate collectors
- 3. After studied unit-3, the student will be able to design the thermal energy storage devices
- 4. After studied unit-4, the student will be able to understand the principles of photovoltaic conversion
- 5. After studied unit-5, the student will be able to know other forms of renewable energy sources.

OPEN ELECTIVE PAPER-1 (to choose 1 out of 3)

Name of the course/subject:M.Sc Physics Name of the Paper:B. Basic Physics Hours of teaching: 3 Semester: I Credits: 3 Paper type: Open Elective

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Course objectives

- 1. Students can learn the importance of measurements and its units
- 2. To study the basic concepts of heat and different scales of temperatures
- 3. To learn the basics of charges and know about Ohm's law
- 4. To understand the different types of wave motion and its properties
- 5. To teach the importance of light energy and propagation of light

UNIT-1: Fundamentals of Physics

Need of measurement and unit-definition of unit, requirements of standard unit, systems of units-CGS,MKS and SI, fundamental and derived quantities and their units - Least count and range of instrument, least count of vernier caliper, micrometer screw gauge-Definition of accuracy, precision and error, estimation of errors - absolute error, relative error and percentage error, rules and identification of significant figures.

UNIT2: Thermal Physics

Heat-unit of heat-Different scales of temperatures, thermal expansions, Calorimetry – specificheat, latent heat, triple point, transmission of heat, heat conductivity, Black body, Stefan Boltzmann Law, Wien's Displacement Law,

UNIT-3: Electricity

Concept of charge, Coulomb's inverse square law, Electric field, intensity, potential and potential difference.-Electric current, Ohm's law, laws of series and parallel combination of resistance -D.C. circuits, Kirchhoff's law, heating effect & chemical effect of current

UNIT-4: Waves

Definition of wave motion, amplitude, period, frequency, and wavelength, relation between velocity, frequency and wavelength, longitudinal and transverse wave, principle of superposition of waves, definition of stationary wave , node and antinode, definition of resonance with examples, Formula for velocity of sound in air-Factors affecting the velocity of sound-Doppler effect

UNIT-5: Light

Reflection, Refraction and total internal reflection of light and their applications-Mirrors-Lenses-Aberration in Lenses-spherical aberration-Prism-dispersion-dispersive power of a prism-refractive index of a prism- Optical instruments – microscopes, telescopes, binoculars, Defects of Human Eye.

Text Book

Unit-1 to Unit-5

- 1. N Subramaniam&BrijLal, Principles of Physics, BrijlalSubramaniam, S.ChandCo.,Ltd, New Delhi,2001.
- 2. Plus one and Plus two Physics Books–TN State Board.
- 3. Plus one and Plus Two Physics Books-NCERT/CBSE.

Reference Books

- 1. N Subramaniam&BrijLal, Heat and Thermodynamics, S.ChandCo.,Ltd, New Delhi,2001.
- 2. D Jayaraman and K Ilangovan, Thermal Physics, Ananda Book Depot, Chennai, 2018.
- 3. K Ilangovan, Properties of Matter and Sound, Ananda Book Depot, Chennai, 2018.
- 4. R Murugeshan, Electricity and Magnetism, S Chand & Co., Ltd., New Delhi, 2006.
- 5. N SubramanyamBrijLal, A Text Book of Sound, Vikas Publishing House Pvt. Ltd., New Delhi, 2016.
- 6. N Subramanyam&BrijLal, Waves and Oscillations, Vikas Publishing House Pvt. Ltd., New Delhi, 2016.
- 7. J Jayachitra and M Gunasekaran, Properties of Matter and Acoustics, KRU Publications, Chennai, 2007.
- 8. N Subramanyam&BrijLal and MN Avadhanulu, A Text Book of Optics, S.Chand& Co. Ltd,New Delhi, 2010.
- 9. The Feynman Lectures on Physics, Vols. I, II and III, by R P Feynman, RB Leighton and M Sands, Narosa, New Delhi, 1998.
- 10. Fundamentals of Physics, 6th Edition by D Halliday, R Resnick and J Walker, Wiley NY 2001.

- 1. <u>https://www.quora.com/What-are-fundamental-units-and-derived-units</u>
- 2. <u>http://tnschools.gov.in/textbooks</u>
- 3. <u>https://ncertbooks.ncert.gov.in/login</u>
- 4. https://en.wikipedia.org/wiki/Heat
- 5. https://learn.sparkfun.com/tutorials/voltage-current-resistance-and-ohms-law/all
- 6. <u>http://agni.phys.iit.edu/~vpa/wavesosci.html</u>
- 7. https://en.wikipedia.org/wiki/Light

- 8. <u>https://www.youtube.com/watch?v=dzR7rcO2-fl</u>
- 9. <u>https://www.youtube.com/watch?v=GXwZ3LMb-ik</u>
- 10. <u>https://www.youtube.com/watch?v=32q5x-81H5Q</u>
- 11. https://www.youtube.com/watch?v=sBb5WUw2_2I

Course outcomes

- 1. After studied unit-1, the student will be able to know the fundamental quantities and its units and also they can derive the derived quantities and its units
- 2. After studied unit-2, the student will be able to learn about heat and its measurements.
- 3. After studied unit-3, the student will be able to distinguish between positive and negative charges and they can Ohm's law
- 4. After studied unit-4, the student will be able to study the basics of sound and its properties and also they formulate the expression for velocity of sound
- **5.** After studied unit-5, the student will be able to understand the basic phenomenon of light and learn about the optical instruments like telescope, microscope etc.

Communication Physics

choose 1 out of 3)

Name of the course/subject:M.Sc Physics	Semester: I
Name of the Paper:C. Communication Physics	Credits: 3
Hours of teaching: 3	Paper type: Open Elective
Course objectives	

- 1. From the course students can study the principles of radio transmission and reception.
- 2. To learn the basic principle of fiber optics and its application for communication system
- 3. To teach the introduction on radar system and its application
- 4. To know the history of satellites and its features
- 5. To study the concept of cellular phones and to understand the Wi-Fi network system.

UNIT -1: Radio transmission and Reception

Transmitter: Modulation - types of modulation-amplitude modulation -modulation factorsideband frequencies in AM wave-limitations of amplitude modulation - frequency modulation-comparison of FM and AMDemodulation-Essentials in demodulation.Receivers: A.M. radio receivers -Types of A.M. radio receivers – Stages ofsuperhetrodyne radio receiver-Advantages of superhetrodyne circuit –FMreceiver-Difference between FM and AM receivers.

UNIT-2: Fiber optic Communication

Introduction -Basic principle of fiber optics – Advantages – Construction of optical fiber-Acceptance angle and Numerical aperture –Classification of optical fibers based on the refractive index profile – Classification of optical fibers based on the number of modes of propagation – Losses in optical fibers – Attenuation – Fiber optic communication – Advantages.

UNIT-3: Radar Communication

Introduction -Basic radar system -Radar range –Antenna scanning – Pulsedradar system – A Scope- Plan position indicator-Search radar- Trackingradar- Moving target indicator-Doppler effect-MTI Principle- CW DopplerRadar- Frequency modulator CW Radar.

Unit-4: Satellite Communication

Introduction – history of satellites – satellite communication system –satellite orbits Basic components of satellite communication system-constructional features of satellites-Commonly used frequency in satellite-communication- Multiple access – communication package – antenna- power-source – satellite foot points- satellite communication in India.

UNIT -5: Mobile Communication

Introduction-The concept of cell –Basic cellular mobile radio system-Thecellphone-Facsimile-Important features of Fax machine-Application of Facsimile – VSAT (very small aperture terminals) – Modem – IPTV (internet protocol television) –Wi-Fi-4G (Basic ideas only).

Text Books

Unit 1

1. V.K.Metha, Principles of Electronics, S. Chand & Company Ltd., 2013

Unit 2 to Unit 5

1. Anokh Singh and Chopra A.K., Principles of communicationEngineering, S.Chand& Company Pvt. Ltd., 2013.

Reference Books:

- 1. I. PoornimaThangam, Satellite communication, Charulatha Publications, 2012.
- 2. Dennis Roddy and John Coolen, Electronic Communication, PHI, 1990.
- 3. William C.Y. lee, Cellular telecommunication (second edition), TataMcgraw Hill, 1991.

- 1. https://en.wikipedia.org/wiki/Radio
- 2. <u>https://www.britannica.com/technology/radio-technology</u>
- 3. https://en.wikipedia.org/wiki/Fiber-optic communication
- 4. https://en.wikipedia.org/wiki/Radar
- 5. http://archive.mu.ac.in/myweb_test/Satelight%20Comm..pdf
- 6. https://www.youtube.com/watch?v=q8U_mne2fO0
- 7. <u>https://www.youtube.com/watch?v=-</u> ap00IUJm7k&list=PLFW6IRTa1g83YaqmM9r2MAAiJVY93bOP7
- 8. <u>https://www.youtube.com/watch?v=bXcY5Kjz8Hw</u>
- 9. <u>https://www.youtube.com/watch?v=dt4Ce8gQPns&list=PLAnjLC20C-XQnoowCtt-67WmyxoQPu2Fi</u>
- 10. <u>https://www.youtube.com/watch?v=f2wlHL1Sok8&list=PLuv3GM6-gsE3ypUYh43pPuZsXxJVG1e7F</u>

Course outcomes

- 1. After studied unit-1, the student will be able to understand the different types of modulation will be used in radio transmission and reception.
- 2. After studied unit-2, the student will be able to know the basics of fiber optics and its types
- 3. After studied unit-3, the student will be able to learn the principle of radar communication
- 4. After studied unit-4, the student will be able to describe the satellites and its importance,
- **5.** After studied unit-5, the student will be able to demonstrate the different types of mobile phones and updating the knowledge about Wi-Fi and fourth generation of communication system.

ANNAMALAI UNIVERSITY, CORE PAPER-4

Name of the course/subject: M.Sc Physics Name of the Paper: Mathematical Physics-II Hours of teaching: 5 Semester: II Credits:4 Paper type: Core

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Course objectives

- 1. To teach the basics of complex variables and formulate the different theorems
- 2. To provide the knowledge on partial differential equations and to get the solutions of two and three dimensional heat flow
- 3. To expose an idea about Fourier and Laplace's integral Transforms
- 4. To describe the basics of group theory and different representation of a group
- 5. To explain the different probability distributions and theory of errors

UNIT-1: Complex Variables

Functions of a complex variable – Analytic function-The necessary and sufficient conditions-Cauchy-Riemann Differential equations- Cauchy-Riemann equations in polar form-Lapalce equation-Line integral of a complex function-Basic properties of the complex line integrals-Cauchy's integral theorem with proof-Cauchy's Integral formula with proof-and formula -Derivatives of an analytic function-Taylor and Laurent's series with proof-Cauchy Residue theorem expansions-Residues and their evaluation- Residue theorem -Evaluation of definite integrals.

UNIT-2: Partial differential equations

Introduction-Laplace's equations – solutions of Laplace's Equations in Cartesian coordinates-Two dimensional cylindrical coordinates-spherical polar coordinates-Diffusion equation (Fourier equation of heat flow) – solutions of two and three dimensional heat flow –The equation of motion for the vibrating string-D' Alembert's solution.

UNIT-3: Fourierand Laplace's Integral Transforms

Fourier's Transform-Infinite Fourier Sine and Cosine Transforms-Properties of Fourier's Theorem- Finite Fourier sine and cosine transforms- Simple applications of Fourier Transforms-Laplace transforms- Properties of Laplace Transforms-Convolution or Faltung Theorem-Evaluation of Inverse Laplace Transforms by Convolution Theorem-Evaluation of Laplace Transform by using Differential Equations-with constant and variable coefficients.

UNIT-4: Group Theory

Concept of a group-Examples of group-Abelian group-Cyclic group-Group multiplication table-Subgroups-Group of order two and three-Conjugate elements and classes-Isomorphism and homomorphism-Symmetry operations and symmetry elements-Group multiplication table for water molecule-Molecular points groups-Matrix representation of symmetry

operations- Reducible and irreducible representations –The Great Orthogonally theorem with explanation (no proof)- Character Table for C_{2v} and C_{3v} Point groups-Infrared and Raman activity for CH₃Cl molecule-The three dimensional rotation group SO(3)-The special unitary groups SU(2) and SU(3).

UNIT-5: Probability

Definition of probability-A priori probability- A posterior probability-Repeated trials-Sample space-random variables-The expectation-The Laplace De Moivre Limits Theorem-Theoretical Distributions-Binomial distribution-The constants or first four moments, mode and moment generating function of Binomial distribution-Poisson's distribution- The constants or first four moments, mode and moment generating function.

Text Books

Unit -1 to Unit -3

1. Satyaprakash, Mathematical Physics with Classical Mechanics Sultan Chand & sons, New Delhi, 2016.

Unit-4

- 1. Satyaprakash, Mathematical Physics with Classical Mechanics Sultan Chand & sons, New Delhi, 2016
- 2. Aruldhas G, Molecular Structure and Spectroscopy, Prentice-Hall of India PVT Ltd, New Delhi, 2005.
- 3. P.K. Chattopadhyay, Mathematical Physics, New Age International Publishers, New Delhi, 2016.

Unit-5

- 1. B.S. Rajput, Mathematical Physics, PragatiPrakashan, Meerut, 2009
- 2. Satyaprakash, Mathematical Physics with Classical Mechanics Sultan Chand & sons, New Delhi, 2016.

Reference Books

- 1. H.K. Dass, Dr. Rama Verma, Mathematical Physics, New Delhi, 2014.
- 2. B.D. Gupta, Mathematical Physics, Vikas publishing house 3rd Edition, New Delhi, 2006.

- 1. https://en.wikipedia.org/wiki/Analytic_function
- 2. https://en.wikipedia.org/wiki/Cauchy%E2%80%93Riemann equations
- 3. https://dlmf.nist.gov/1.14
- 4. <u>https://www.youtube.com/watch?v=qnmUzjnY35M</u>
- 5. <u>https://www.youtube.com/watch?v=ey9rAu6-uEY</u>
- 6. http://www.bhojvirtualuniversity.com/slm/mscche1p4.pdf

- 7. <u>https://www.youtube.com/watch?v=oBPQsOrhbuc&t=2s</u>
- 8. <u>https://www.youtube.com/watch?v=82Ad1orN-</u> <u>NA&list=PLDp9Jik5WjRtVUYHjx_Q0KohHqqDVKhcX</u>
- 9. https://www.youtube.com/watch?v=WWv0RUxDfbs
- 10. https://en.wikipedia.org/wiki/Binomial_distribution

Course outcomes

- 1. After studied unit-1, the student will be able to learn analytic functions, derive an equation forCauchy-Riemann Differential equations in different forms about Taylor, Laurent's series and Cauchy Residue theorem
- 2. After studied unit-2, the student will be able to obtain the solution for Laplace's Equations in Cartesian coordinates and also fortwo and three dimensional heat flow
- 3. After studied unit-3, the student will be able to study the Fourier and Laplace's Integral Transforms in detail
- 4. After studied unit-4, the student will be able to describe group theory and construct the character table for different point groups
- 5. After studied unit-5, the student will be able to acquire theory of probability and different theoretical distributions.

CORE PAPER-5

Name of the course/subject:	M.Sc Physics	Semester: II
Name of the Paper: Electro	Magnetic Theory	Credits:5
Hours of teaching: 4		Paper type: Core

Course Objectives

- 1. To provide a clear and logical presentation of Electrostatics and electrodynamics.
- 2. To introduce the Maxwell's equations applicable in electromagnetism.
- 3. To make the students understand the source of production and propagation of electromagnetic waves.

UNIT-1: Electrostatics

System of charges: Charge distribution-charge densities-Electric field-Electrostatic potentialmultipole expansion-Gauss' law-integral and differential forms.- Laplace and Poisson equations-Solution of Laplace's equation in cartesion and spherical coordinates- Conducting sphere in a uniform electric field. Dielectric polarization: Polarization and displacement vectors-molecular polarazibility and electrical susceptibility-dielectric sphere in a uniform field-Electrostatic energy

UNIT-2: Magnetostatics

Biot-Savart Law –integral and differential forms-Application to a long wire carrying steady current- Ampere's circuital law –integral and differential forms-Application to a long wire wire and a solenoid carrying current. Magnetic vector potential-charecteristics-application to a distant current loop-Magnetic scalar potential- characteristics- application to a circular coil carrying current-Magnetostatic energy.

UNIT-3:Maxwell's equations and Applications:

Faraday's laws of Induction - Maxwell's displacement current – continuity equation for current density –Maxwell's equations -differential and integral forms- significance of Maxwell;s equations-Maxwell's equations in free space, linear isotropic media and in conducting medium- Gauge invariance - Coulomb and Lorentz gauges –inhomogeneous wave equations-Lorentz force- Lorentz force interms of magnetic scalar and vector potentials- Energy and momentum of the field - Poynting's theorem - Conservation laws for a system of charges and electromagnetic fields.

UNIT-4: Electromagnetic fields and Radiation from localized sources:

Retarded potentials- oscillating electric dipole: magnetic vector and scalar potentials-electric and magnetic fields-power radiated and radiation resistance-Radiation from a small current element-Radiation from a linear antenna- Radiation from a centre fed half wave linear antenna- Antenna array.

UNIT-5: EM Wave propagation

Plane wave equation and solution- Wave propagation in free space, isotropic dielectric and in a conducting medium-skin depth-Reflection and refraction at a plane interface:kinematic and dynamic properties-Fresnel's formulae-propagation between two perfectly conducting planes –propagation in a rectangular wave guide.

Text Books

Unit 1 to Unit 5

- 1. SatyaPrakash, Electromagnetic theory and Electrodynamics, Meerut, KedarNath Ram,2010.
- 2. David.J.Griffiths, Introduction to Electrodynamics, New Delhi, Addison Wesley, 2012.
- 3. Uma Mukherji, , Electromagnetic field Theory and Wave Propagation, New Delhi, Narosa publishing House, New Delhi, 2006.

Reference Books

- 1. Agarwal G.C, Agarwal G. C., Chopra K. K., Electromagnetic Theory, K Nath& Co.,2010.
- 2. Edward C.Jordan, Keith G. Balmain, Electromagnetic waves and Radiating systems, Prentice Hall of India, 2005.
- 3. Reitz John R., Foundations of Electromagnetic Theory, , Pearson Education India, New Delhi, 2009.
- 4. Puri S.P, Classical Electrodynamics, , Tata McGraw-Hill publishing company Limited, New Delhi, 1997.
- 5. Prasad K.D Antenna and Wave Propagation, ,Sathyaprakashan, New Delhi, 1993.
- 6. Meenakumari, R., Subasri R., Electromagnetic fields, second edition, , New Age
- 7. International Publishers, New Delhi, 2008.
- 8. J.D.Jackson, Classical Electrodynamics, 3rd Edition, Wiley Eastern Ltd, New Delhi, 1998.

- 1. https://www.slideshare.net/abhishekchoksi56/poissons-and-laplaces-equation
- 2. <u>https://www.youtube.com/watch?v=m9CExTmve_A</u>
- 3. <u>https://www.youtube.com/watch?v=Nwnj1JSvfnk</u>
- 4. https://en.wikipedia.org/wiki/Magnetic_potential
- 5. <u>https://en.wikipedia.org/wiki/Displacement_current</u>
- 6. <u>https://www.youtube.com/watch?v=eJJrzekmuiA</u>
- 7. <u>https://www.youtube.com/watch?v=0J_v2kD4Tcs</u>
- 8. https://en.wikipedia.org/wiki/Retarded_potential
- 9. https://en.wikipedia.org/wiki/Electromagnetic_wave_equation
- 10. https://www.youtube.com/watch?v=siaFxvdokmM

Course outcomes

- 1. After studying Unit-1, the students will be able to have a depth knowledge of electrostaticsand clearly understand dielectric polarization.
- After studying Unit-2, the students will be able to know the fundamental laws to find the magnetic field of a source. have depth knowledge of magnetic potential. apply the magnetic scalar and vector potentials to find the magnetic field due to localized source.
- After studying Unit-3, the students will be able to use Maxwell's equations for a system of charge and electromagnetic field. Obtain homogeneous equations for a charged system. Students will be able to understand clearly Gauge transformation and gauge invariance.
- After studying Unit-4, the students will be able to Understand about the oscillating dipole. Know how the power radiated from a linear antenna. Understand clearly antenna arrays.
- 5. After studying Unit-5, the students will be able to

Know the propagation of electromagnetic waves in free space, dielectric medium andConductingmedium.

Have a depth knowledge of kinematic and dynamic properties of electromagnetic waves.

Understand the wave propagation principle in the case of wave guide.

CORE PAPER-6

Name of the course	/subject: M.Sc Physics
Name of the Paper:	Quantum Mechanics-II
Hours of teaching:	4

Semester: II Credits:4 Paper type: Core

Course Objectives

- 1. The primary objective is to teach the students various approximation methods in quantum mechanics.
- 2. The important topic of quantum scattering is also dealt with. Relativistic quantum theory like Klein-Gordon equation and Dirac equation is also covered

UNIT-1: Approximation Methods for Stationary Systems

Time-independent perturbation theory, (a) non- degenerate and (b) degenerate – Variational method and its applications – WKB method and its applications

UNIT-2: Approximation Methods for time-dependent perturbations

Time dependent perturbation theory – Transition to a continuum of final states, Fermi's GoldenRule – Application to constant and harmonic perturbations – Sudden and adiabatic approximations

UNIT-3: Scattering

Wave packet description of scattering – Formal treatment of scattering by Green's function method – Born approximation and applications – Partial wave analysis – Optical theorem

UNIT-4: Relativistic Quantum Mechanics

Klein – Gordon and Dirac equations – Properties ofDirac matrices – Plane wave solutions of Dirac equation – Spin and magnetic moment of theelectron – Non-relativistic reduction of the Dirac equation

UNIT-5: Dirac Equation

Covaiant form of Dirac equation – Second quantization of Klein-Gorden field – Creation and annihilation operators – Properties of gamma Matrices – Traces – Relativistic invariance of Dirac equation – Probability density – current four vector – Bilinear Covariant.

Text Books

Unit 1 to Unit 5

- 1. P. M. Mathews and K. Venkatesan, 1976, A Text book of Quantum Mechanics, Tata McGraw-Hill, New Delhi.
- 2. L. I. Schiff, 1968, Quantum Mechanics, 3rd Edition, International Student Edition, MacGraw-Hill Kogakusha, Tokyo.
- 3. E. Merzbacher, 1970, Quantum Mechanics, 2nd edition, John Wiley and Sons, New York.
- 4. V. K. Thankappan, 1985, Quantum Mechanics, 2nd Edition, Wiley Eastern Ltd, New Delhi.
- 5. J.D. Bjorken and S.D. Drell, 1964, Relativistic Quantum Mechanics, MacGraw-Hill New York.
- 6. V. Devanathan, 2005, Quantum Mechanics, Narosa Publishing House, New Delhi.
- 7. S.L. Gupta and I.D.Gupta Quantum Mechanics.

Reference Books

- 1. P. A. M. Dirac, 1973, The Principles of Quantum Mechanics, Oxford University Press, London.
- 2. L. D. Landau and E. M. Lifshitz, 1958 Quantum Mechanics, Pergomon Press, London.
- 3. S. N. Biswas, 1999, Quantum Mechanics, Books and Allied, Kolkata.
- 4. G. Aruldhas, 2002, Quantum Mechanics, Prentice-Hall of India, New Delhi.
- 5. J. S. Bell, Gottfried and M.Veltman, 2001, The Foundations of Quantum Mechanics, World Scientific.
- 6. V. Devanathan, 1999, Angular Momentum Techniques inQuantum Mechanics, Kluwer Academic Publishers, Dordrecht.
- 7. Lewis H. Ryder, Quantum Field Theory ,2ndEd., Cambridge University. Press,1996
- 8. J.D. Bjorken and S.D. Drell, Relativistic Quantum Fields, Vol. II (McGraw-Hill, 1978
- 9. J.D. Bjorken and S.D. Drell, Relativistic Quantum Fields, Vol.IMcGraw-Hill, 1964.

- 1. http://www.freebookcentre.net/physics-books-download/Lecture-Notes-on-Quantum-Physics.html
- 2. http://www.freebookcentre.net/physics-books-download/Lecture-Notes-Quantum-Physics.html
- 3. http://www.freebookcentre.net/physics-books-download/Quantum-Physics-by-Prof.-Graeme-Ackland.html
- 4. https://web.phys.ksu.edu/vqm/AVQM%20Website/AVQMweb.htm
- 5. https://ocw.mit.edu/courses/physics/8-04-quantum-physics-i-spring-2016/lecture-notes/
- 6. http://www.eas.asu.edu/~vasilesk/EEE434.html
- 7. http://minty.caltech.edu/Ph125a/
- 8. http://walet.phy.umist.ac.uk/QM/LectureNotes/
- 9. http://www.physics.usu.edu/torre/Classical Field Theory/Lectures/02 KG.pdf
- 10. https://www.youtube.com/watch?v=oKqvj4Qv9Ts

Course Outcomes

- 1. Understand the concept of perturbation theory to solve problems in quantum mechanics.
- 2. Acquire the knowledge of variation methods and able to solve harmonic perturbation step by step using mathematical methods.
- 3. Formulates ideas on born approximation transformation and concepts of scattering theory.
- 4. Understand the Dirac matrices and gained knowledge about spin and magnetic movement of electron.
- 5. Able to understand the creation and annihilation operator and gain the knowledge about anti particle.

CORE ELECTIVEPAPER -2 (Choose 1 out of 3)

Name of the course/s	ubject: M.Sc Physics	Semest	er: II
Name of the Paper:	A. Nanoscience	Credits:3	
Hours of teaching:	4	Paper type: Core Elective	

Course objectives

- 1. The course gives the some fundamental concepts of nanomaterials and its properties
- 2. Students can learn the synthesis of nanostructure materials by different methods
- 3. To expose an idea about quantum dots and growth of the quantum dots
- 4. To demonstrate the different tools for the characterization of synthesized materials
- 5. To study the important applications of nanomaterials and nanocomposites.

UNIT-1: Fundamentals of Nanoscale Science

Introduction - nano and nature - background to nanotechnology -scientific revolutions opportunities at the nanoscale - time and lengthscale in structures - surfaces and dimensional space - evolution ofband structures and Fermi surfaces - electronic structure ofnanocrystals - bulk to nano transition - size and shapes -dimensionality and size dependent phenomena-Energy landscapes basic intermolecular forces – interdynamicaspects of intermolecular forces.

UNIT-2: Classification of nanoparticles and its properties

Metal Nanoparticles: Size control of metal nanoparticles, Structural, Surface, electronic and optical properties.

Semiconductor Nanoparticles: solid state phase transformation,Excitons, Quantum confinement effect, Semiconductor quantum dots(SQDs), Correlation of properties with size, Quantum Well, QuantumWires, Super lattices band and Band offsets, Quantum dot lasers. Magnetic nanomaterials: Fundamentals of magnetic materials, Dia,Para, Ferro, Ferric, and Superpara magnetic materials, NanostructuredMagnetism.

Semiconductor Nanocomposites: Types of Nanocomposites(Metal oxides, ceramic and Glass), Core - Shell nanoparticles – Typesof systems - properties of nanocomposites. Carbon Nanostructures: Introduction, Fullerenes, C60, CNT,mechanical, optical and properties.

Unit 3: Synthesis of Nanomaterials

Physical methods: Thermal evaporation, Spray pyrolysis, Molecular beam epitaxy (MBE), Physical vapour deposition (PVD), Microwave heating, Electric arc deposition, Ion implantation.

Chemical methods: Chemical and co - precipitation, Solfundamentals - sol - gel synthesis of metal oxides, Micro emulsions orreverse micelles, Solvothermal, Sonochemical

synthesis, Electrochemical synthesis, Photochemical synthesis, Langmuir -blodgett (LB) technique, Chemical vapour deposition (CVD)

Unit 4: Characterization Techniques

Powder X - Ray Diffraction, Scanning electron microscope(SEM), Transmission electron microscope (TEM), Scanning tunnelling microscope (STM), Atomic force microscope (AFM),Scanning probe microscopy (SPM), UV - Visible absorption,Impedance measurement, V - I characteristics, Vibrating sample magnetometer (VSM)-Brunauer - Emmett - Teller (BET) Surface Area Analysis,Energy dispersive X - ray (EDX), X - ray photoelectron spectroscopy(XPS) and Photoluminescence.

Unit 5: Applications of Nanomaterials and Nanocomposites

Nanophotonics and Devices: ID, 2D, 3D Photonic crystals, Couplers, Waveguides, Photonic crystal fibres, Optical data storagesystems and Quantum computing

Medical applications: Imaging of cancer cells, Biological tags andTargeted nano drug delivery system.

Nanosensors: Sensors based on physical properties -Electrochemical sensors, Sensors for aerospace, defence andBiosensors.

Energy: Solar cells, LEDs and Photovoltaic device applications.

Photocatalytic applications: Air purification, Water purifications and Volatile organic pollution degradation.

Carbon nanotubes: Field emission, Fuel cells and Display devices.

Text Books

Unit 1 to Unit 5

- 1. B. Viswanathan, Structure and Properties of Solid State Materials, 2nd Edition, Alpha Science International,2006.
- 2. T.Pradeep, Nano The Essentials, Tata McGraw -Hillpublishing company limited,2007.

Reference Books

- 1. Pulickel M. Ajayan, Linda S. Schadler, Paul V. Braun, Nanocomposite Science and Technology, John Wiley & Sons, 2006.
- 2. Günter, Schmid, Nanoparticles: From Theory to Application, 2nd Edition, John Wiley & Sons, 2011.
- 3. SulabhaK.Kulkarni, Nanotechnology: Principles And Practices, Capital publishing company,2007.
- 4. B. Viswanathan, Nanomaterials, Narosa PublishingHouse Pvt. Ltd., New Delhi, 2009.

- 5. A. K. Bandyopadhyay, Nano Materials, 2nd Edition, NewAge International Publishers Ltd., New Delhi, 2007.
- 6. Charles P.Poole, Frank J. Owens, Introduction to nanotechnology, John Wiley & Sons publication, 2003.

E-Materials

- 1. <u>https://www.ncsl.org/print/standcomm/sctech/Roberto0806.pdf</u>
- 2. <u>https://education.mrsec.wisc.edu/what-is-nanotechnology-defining-nanotechnology/</u>
- 3. https://en.wikipedia.org/wiki/Quantum_dot
- 4. <u>https://www.youtube.com/watch?v=AGfOQJPjGEE</u>
- 5. <u>https://www.youtube.com/watch?v=0JW6WcbcFFY</u>
- 6. <u>https://nptel.ac.in/content/storage2/courses/117104022/Lectures/Lec8.pdf</u>
- 7. <u>https://nptel.ac.in/content/storage2/nptel_data3/html/mhrd/ict/text/113106064/</u> <u>lec12.pdf</u>
- 8. <u>https://www.youtube.com/watch?v=mC0rYNIMz9Q</u>
- 9. https://www.youtube.com/watch?v=RnUGSDW-Tfk
- 10. https://en.wikipedia.org/wiki/Nanophotonics

Course Outcomes

- 1. After studied unit-1, the student will be able to understand the nanoscale and nanomaterial.
- 2. After studied unit-2, the student will be able to learn how to synthesis the nanostructured materials
- 3. After studied unit-3, the student will be able to distinguish between nanoparticles and quantum dots
- 4. After studied unit-4, the student will be able to describe the different tools will be used for characterization of the nanomaterial.
- 5. After studied unit-5, the student will be able explain the different applications of nanotechnology

CORE ELECTIVE PAPER -2 (to choose 1 out of 3)

Name of the course/subject: M.Sc Physics Name of the Paper: B. Electronics Instrumentation Hours of teaching: 4

Semester: II Credits:3 **Paper type: Core Elective**

Course Objectives

- 1. Students can learn the principle and classification of transducers
- 2. To know the principle, block diagram and working of some digital instruments
- 3. To study the working and applications of analytical instrumentation techniques
- 4. To teach the some basics of bio-medical instruments
- 5. To acquire the knowledge about internal and external peripheral devices

UNIT-1 : Transducers

Classification of Transducers - Principle, construction and working of Thermistor - LVDT, Electrical strain gauges and capacitive transducers, Photoelectric transducer, Piezoelectric transducer - Photovoltaic transducer, Photo emissive transducer, Measurement of nonelectrical quantities - Strain, Displacement, temperature, Pressure, Magnetic fields, vibration, optical and particle detectors.

UNIT-2: Digital Instrumentation

Principle, block diagram and working of Digital frequency counter, digital multimeter, digital pH meter, digital conductivity meter and digital storage oscilloscope. Introduction to digital LCR meters, Working of LCR, introduction to virtual instrumentation, Supervisory control and data acquisition (SCADA), data acquisition system.

UNIT-3: Analytical Instrumentation

Principle, block diagram, description, working and applications of Photoelectron Spectroscopy (XPS) ,Auger Electron Spectroscopy, Atomic Absorption Spectroscopy, Secondary Ion Mass spectroscopy (SIMS), Carbon Hydrogen Nitrogen Sulphur analyzer (CHNS). Flame emission spectrometer and ICP -Basic concepts of Gas and Liquid Chromatography.

UNIT-4: Bio-Medical Instrumentation

Physiological transducers to measure blood pressure, body temperature - Sources of Bioelectric potentials - resting potential, action potential, bio-potential electrodes - Principle, block diagram and operation of ECG, EEG and EMG recorders. Principle-block diagram and operation of CT Scanner -MRI Machine.

UNIT-5: Computer Peripherals

Introduction to Internal and external peripherals- Printers - Printer mechanism – Classification - Dot matrix, Ink jet and laser printers - Basic concepts of key board and mouse. Mass data storage - Hard Disk - Optical disk (CD) – DVD –Blueraydisc ,Flash memory – I/O Interfaces-Universal Serial Bus (USB).Communications(COM),Serial ports.

Text Books

Unit 1 to Unit 5

- 1. Dr.Rajendra Prasad, Electronic Measurements and Instrumentation, Khanna Publications.
- 2. S.Ramabhadran, Electronic Measurements and Instrumentation Khanna Publications.
- 3. Leslie Cromwell fred J. Weibell, Erich A. Pfeiffer, Biomedical Instrumentation and Measurements 2 nd Edition, Prentice –Hall of India Private Ltd, New Delhi, 2010.
- 4. D. Kealey and P.J. Haines, Analytical chemistry, Viva Publications, New Delhi, 2002.
- 5. R.LakshmiRekha., C.Ravikumar, Biomedical Instrumentation and Medical electronics, Lakshmi Publications, Chennai, 2009.

Reference Books

- 1. S.M. Dhir, Electronics and Instrumentation, Khanna Publishers, Khandpur.
- 2. Albert D.Heltrick, William D. Cooper, Modern Electronics Instrumentation and measurement Techniques, PHI, New Delhi.
- 3. Douglas A.Skoog, F.James Holler, Timothy A.Nieman, Principles of Instrumental Analysis, Harcourt College publishers,5th edition, 2001
- 4. A.J.Bouwens, Digital Instrumentation, , McGraw Hill international, New Delhi, 2002
- 5. W.D.Cooperand A.D.Helfrick, Electronic Instrumentation and Measurement Techniques,1st edition, Dorling KinderslyPvt. Ltd. India, 2009

- 1. <u>https://en.wikipedia.org/wiki/Transducer</u>
- 2. <u>https://www.youtube.com/watch?v=AZdCXJx4xSA</u>
- 3. <u>https://www.youtube.com/watch?v=CJ6YWBuHoes</u>
- 4. https://en.wikipedia.org/wiki/Multimeter
- 5. <u>https://en.wikipedia.org/wiki/X-ray_photoelectron_spectroscopy</u>
- 6. https://www.youtube.com/watch?v=XpDqJfybma4
- 7. <u>https://www.youtube.com/watch?v=xIZQRjkwV9Q</u>
- 8. https://en.wikipedia.org/wiki/Electrocardiography
- 9. https://en.wikipedia.org/wiki/USB
- 10. https://www.digitaltrends.com/computing/usb-c-vs-usb-a/

Course Outcomes

- 1. After studied unit-1, the student will be able to know the principle, working and types of transducers.
- 2. After studied unit-2, the student will be able to demonstrate the principle, function of different digital instruments like digital multimeter.
- 3. After studied unit-3, the student will be able to explain the working and applications of Photoelectron Spectroscopy (XPS) ,Auger Electron Spectroscopy, Atomic Absorption Spectroscopy.
- 4. After studied unit-4, the student will be able to describe the operation of ECG,EEG and EMG biomedical instrumentations.
- 5. After studied unit-5, the student will be able to know the classification of printers, function of hard disk, CD and DVD.

ANNAMALAI UNIVERSITY CORE ELECTIVE PAPER-2 (to choose 1 out of 3)

Name of the course/subject: M.Sc Physics Name of the Paper: C: Non-linear optics Hours of teaching: 4 Semester: II Credits:3 Paper type: Core Elective

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Course objectives

- 1. To study the basics of Lasers and its types
- 2. To acquire the knowledge on introduction to non-linear optics and its generation
- 3. To teach the multiphonon processes and hence to study the optical Kerr effect
- 4. To expose the basic information on non-linear optical materials
- 5. To know about the fundamentals of fiber optics and different types of fibers

UNIT-1: Lasers

Gas lasers – He-Ne, Ar+ ion lasers – Solid state lasers – Ruby – Nd:YAG, Ti sapphire - Organic dye laser – Rhodamine – Semiconductor lasers – Diode laser, p-n-junctionlaser and GaAs laser.

UNIT-2: Basics of Nonlinear Optics

Wave propagation in an anisotropic crystal – Polarization response of materials to light--Harmonic generation – Second harmonic generation – Sum and difference frequencygeneration– Phase matching – Third harmonic generation – Terahertz –Bistability-Selffocusing.

UNIT-3: Multiphoton Processes

Two photon process – Theory and experiment – Three photon process – Parametricgeneration of light – Oscillator – Amplifier – Stimulated Raman scattering – Intensitydependent refractive index -- Optical Kerr effect -- Foucault effect – Photorefractive, electronic and optic effects.

UNIT-4: Nonlinear Optical Materials

Basic requirements – Inorganics – Borates – Organics – Urea, Nitroaniline –Semiorganics – Thoreau complex – Laser induced surface damage threshold.

UNIT-5: Fiber Optics

Step -Graded index fibers – Wave propagation – Fiber modes – Single and multimodefibers-Numerical aperture – Dispersion – Fiber bandwidth- Fiber losses -Scattering, absorption, bending, leaky mode and mode coupling losses-Attenuationcoefficient -Material absorption.

Text Books

Unit 1 to Unit 5

- 1. K.R. Nambiar, *Lasers: Principles, Types and Applications* (New Age Inter-national Publishers Ltd, New Delhi, 2014).
- 2. B.B. Laud, Lasers and Nonlinear Optics, 3rd Edn. (New Age, New Delhi, 2011).
- 3. R.W. Boyd, Nonlinear Optics, 2nd Edn. (Academic Press, New York, 2003).
- 4. G.P. Agarwal, *Fiber-Optics Communication Systems*, 3rd Edn. (John Wiley, Singapore, 2003).

Reference Books

- 1. W.T. Silvast, Laser Fundamentals (Cambridge University Press, Cambridge, 2003).
- 2. D.L. Mills, Nonlinear Optics Basic Concepts (Springer, Berlin, 1998).

E-Materials

- 1. https://en.wikipedia.org/wiki/Laser
- 2. https://en.wikipedia.org/wiki/Helium%E2%80%93neon_laser
- 3. <u>https://www.physics-and-radio-electronics.com/physics/laser/ndyaglaser.html</u>
- 4. <u>https://en.wikipedia.org/wiki/Nonlinear_optics</u>
- 5. https://www.youtube.com/watch?v=3WevI1A2Bdk
- 6. https://shodhganga.inflibnet.ac.in/bitstream/10603/35888/1/chapter1.pdf
- 7. https://www.photonics.com/Articles/Fiber_Optics_Understanding_the_Basics/a25151
- 8. <u>http://www.infocobuild.com/education/audio-video-</u> courses/physics/IntroToNonlinearOptics-IIT-Kharagpur/lecture-12.html
- 9. https://www.slideshare.net/krishslide/nonlinear-optical-materials
- 10. https://en.wikipedia.org/wiki/Graded-index_fiber_

Course Outcomes

- 1. After studied unit-1, the student will be able to understand the laser and its types
- 2. After studied unit-2, the student will be able to know the fundamentals of non-linear optics.
- 3. After studied unit-3, the student will be able to study the multiphonon process in nonlinear optics.
- 4. After studied unit-4, the student will be able to learn the basic requirements for nonlinear optical materials like borates, organics etc.
- 5. After studied unit-5, the student will be able explain the principle, construction and working of fiber modes.

OPEN ELECTIVE PAPER-2 (to choose 1 out of 3)

Name of the course/subject: M.Sc Physics	Semester: II
Name of the Paper: A. Spectroscopy and Lasers	Credits:3
Hours of teaching: 3	Paper type: Open Elective
Course Objectives	

- 1. The aim of the course is to give some fundamentals of spectroscopy and lasers.
- 2. To provide good knowledge on microwave spectroscopy and its applications.
- 3. To teach the different regions of Infrared spectroscopy and its theory.
- 4. Students can acquire facts about Raman spectroscopy and its applications.
- 5. To learn the basics of lasers, its types and applications.

UNIT 1: Microwave Spectroscopy

Classification of molecules-Interaction of radiation with rotating molecule-Rotational spectra of rigid diatomic molecules-Non-rigid rotor-Linear ployatomic molecules-Symmetric and asymmetric top molecules-Design of microwave spectrometer-Applications

UNIT 2: Infrared Spectroscopy

Introduction on Infrared spectroscopy-Vibration energy of a diatomic molecule-Morse curve and the energy of a diatomic molecule-Vibrating diatomic molecule-Vibrations of polyatomic molecules-Normal modes of molecular vibrations-Normal modes of CO_2 and H_2O molecules-Dipole moment change in CO_2 molecule-FTIR spectroscopy-Principle-Instrumentation and applications.

UNIT-3:Raman spectroscopy:

Introduction on Raman effect-Differences between Raman and Infrared Spectra-Classical and quantum mechanical picture of Raman effect-Characteristic parameters of Raman lines-Rotational Raman spectra-Vibrational Raman Spectra-Structure determination using IR and Raman Spectroscopy for CO_2 and H_2O -Laser Raman spectrometer-Principle-instrumentation-Applications of Raman spectroscopy.

UNIT-4: Laser

Basic Principle of Laser – Einstein Coefficients – Condition for light amplification – Population Inversion – Threshold Condition – Line Shape Function – Optical Resonators – Three level and four level systems.

UNIT-5: Laser Types and Applications

Solid State Lasers- Ruby and Nd-YAG Laser-Gas Lasers – He-Ne and CO_2 lasers-Application of laser in industry -cutting and welding-drilling – Surface Hardening-Medical applications.

Text Books Unit-1 to Unit-3

- 1. G. Aruldhas Molecular and Structure and Spectroscopy:, PHI PVT, Ltd, New Delhi, 2007
- 2. H. Kaur, Spectroscopy, PragatiPrakashan, Meerut, 2017.

Unit-4 and Unit-5

1. K. Thyagarajan and AjoyGhatak, Laser Theory and Applications, Cambridge University Press, 1999.

Reference Books

- 1. Colin Banwell, Elaine M. McCash, Fundamentals of Molecular Spectroscopy:, TMH publishers, 2013.
- 2. D.N. Satyanarayana, Vibrational Spectroscopy and Applications, New Age International Publications, New Delhi, 2004.
- 3. G.R.Chatwal and S.K.Anand, Spectroscoy (Atomic & Molecular), Himalaya Publishing House, 2016
- 4. M.N.Avadhanulu, An Introduction to Laser: Theory and Applications, S.Chand and Co., New Delhi, 2001.
- 5. P.K. Palanisamy, Physics for Engineering, Scitech Publishing Pvt. Ltd., Chennai.

- 1. https://en.wikipedia.org/wiki/Microwave_spectroscopy
- 2. <u>https://www.youtube.com/watch?v=3-8nAn0Mo6w</u>
- 3. <u>https://en.wikipedia.org/wiki/Vibrational_spectroscopy_of_linear_molecules</u>
- 4. <u>https://www.youtube.com/watch?v=58wqjy-ALLg</u>
- 5. https://en.wikipedia.org/wiki/Raman_spectroscopy
- 6. <u>https://www.youtube.com/watch?v=Y7GbNd8mMHg</u>
- 7. https://en.wikipedia.org/wiki/Spectroscopy
- 8. <u>https://www.youtube.com/watch?v=ADpmJppu83Q</u>
- 9. https://www.slideshare.net/jaydipkanpariya1/ndyag-laser-working-and-construction
- 10. <u>https://www.youtube.com/watch?v=XI18Is5Lp9I</u>

Course Outcomes

- 1. After studied unit-1, the student will be able to learn more about microwave spectroscopy and its applications.
- 2. After studied unit-2, the student will be able to know the fundamentals of vibrational spectroscopy and can assign normal modes of vibrations for different type of molecules.
- 3. After studied unit-3, the student will be able to distinguish the classical and quantum theory of Raman spectroscopy and it will be applied for structural confirmation of a molecule.
- 4. After studied unit-4, the student will be able to derive the expression for Einstein Coefficients for Stimulated emission of Radiation and learn about three level and four level systems.
- **5.** After studied unit-5, the student will be able describe the different types of Laser and know the condition for population inversion and can study the Laser applications.
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OPEN ELECTIVE PAPER-2 (to choose 1 out of 3)

Name of the course/subject: M.Sc PhysicsSemester: IIName of the Paper: B. Physics for competitive ExamsCredits:3Hours of teaching:3Paper type: Open Elective

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Course Outcomes

- 1. Understand the principle of mechanics and properties of matter.
- 2. Analyze, understand and solve the problems in thermodynamics.
- 3. To study the basics of magnetic field and related phenomenon
- 4. Understand principles physical optics and lasers
- 5. To expose an idea about modern physics and electronics

UNIT -1: General mechanics and Properties of matter

Scalars and Vectors(Concepts), Newton's Equations of Motion, impulse, Principle of conservation of Linear momentum- Direct Collision between two smooth spheres- Circular motion-Relation between linear velocity and angular velocity-Centripetal force- banking of Curved roads- Newton's Lawof Gravitation- Variation of acceleration due to gravity with altitude and depth-Kepler's Laws-Escape velocity- Elasticity-Introduction-Bending of Beams-Cantilever-Viscosity-Poiseuille's method- SurfaceTension-Drop weight method

UNIT-2: Thermodynamics

Boyle's Law, Charle's Law-Ideal gas equation-First law of thermodynamics-Second law of thermodynamics-Carnot Engine- thermodynamic scale of temperature concepts of entropy – temperature entropy diagram – entropy of perfect gas.

UNIT-3: Magnetism

Magnetic field-magnetic intensity-magnetic lines of force-magnetic flux-Biot-Savart's lawstraight conductor, circular coil, solenoid carrying current-Lenz's law.

Magnetic properties of materials: Magnetic intensity, magnetic induction, permeability, magnetic susceptibility. Brief introduction of dia-, para- and ferro-magnetic materials.

UNIT-4: Optics and Laser

Interference- Theory of thin films – Air wedge – Determination of diameter of a thin wire by air wedge –Diffraction-Fresnel and Fraunhofer Diffraction- Polarization-Double refraction-Optical Activity - Specific Rotatory Power.

Laser: Properties of laser- spontaneous and stimulated emission- population inversion, optical pumping- construction and working of Ruby Laser- applications of lasers.

UNIT-V: Modern physics and Electronics

Bohr's theory-Hydrogen spectrum, Nuclear Physics, Binding Energy, X-rays, Alpha,Beta and Gamma rays, Einstein's photo electric effect-Mass-Energyrelation- Semi-conductors-PN Junction Diodes-Half wave rectifier-Zener diode-Voltage regulator-LED-Transistors-NPN-PNP-Modes of Transistors-CE Characteristics of a transistor-Single stageAmplifier.

Text Books

Unit-1

- 1. R Murugeshn, Mechanics and Mathematical Methods, S Chand Pvt Ltd, New Delhi 2016.
- 2. R Murugeshn, Properties of Matter, S Chand Pvt Ltd, New Delhi 2016.
- 3. K Ilangovan, Properties of Matter and Sound, Ananda Book Depot, Chennai, 2018.
- 4. N Subramaniam&BrijLal, Properties of Matter, S.ChandCo.,Ltd, New Delhi,2001

Unit-2

1. N Subramaniam&BrijLal, Heat and Thermodynamics, S.ChandCo.,Ltd, New Delhi,2001

Unit-3

- 1. R Murugeshan, Electricity and Magnetism, S Chand & Co., Ltd., New Delhi, 2006 Unit-4
 - 1. N Subramanyam&BrijLal and MN Avadhanulu, A Text Book of Optics, S.Chand& Co. Ltd,New Delhi, 2010.
 - 2. Laser theory and applications by K. Thyagarajan and AjoyGhatak, Cambridge University Press, 1999.

Unit-5

- 1. R Murugeshan and KiruthigaSivaprasath, Modern Physics, S Chand & Co., Ltd., New Delhi, 2016
- 2. V.K. Mehta and Rohit Mehta, Principles of Electronics, S Chand & Co., Ltd., New
- 3. Delhi, 2014

Reference Books:

- 1. J Jayachitra and M Gunasekaran, Properties of Matter and Acoustics, KRU Publications, Chennai, 2007.
- 2. D Jayaraman and K Ilangovan, Thermal Physics, Ananda Book Depot, Chennai, 2018
- 3. R Murugeshan, Optics & Spectroscopy, S Chand & Co., Ltd., New Delhi, 2006
- 4. An Introduction to Laser : Theory and Applications by M. N. Avadhanulu, S.Chand and Co., New Delhi 2001.
- 5. M.ArulThalapathi, Basic & Applied Electronics, Comptek Publishers, Chennai, 2010

E-materials:

- 1. <u>https://en.wikipedia.org/wiki/Equations_of_motion</u>
- 2. <u>https://www.youtube.com/watch?v=xViRvJxTu6k</u>
- 3. https://en.wikipedia.org/wiki/Elasticity_(physics)
- 4. <u>https://www.youtube.com/watch?v=PoG14wRRQmM</u>
- 5. <u>https://en.wikipedia.org/wiki/First_law_of_thermodynamics</u>
- 6. <u>https://www.khanacademy.org/science/biology/energy-and-enzymes/the-laws-of-thermodynamics/v/first-law-of-thermodynamics-introduction</u>
- 7. https://byjus.com/physics/biot-savart-law/
- 8. https://en.wikipedia.org/wiki/Biot%E2%80%93Savart_law
- 9. https://en.wikipedia.org/wiki/Wave_interference
- 10. https://www.youtube.com/watch?v=CAe3lkYNKt8
- 11. https://en.wikipedia.org/wiki/X-ray
- 12. <u>https://byjus.com/physics/x-ray/</u>
- 13. https://www.electrical4u.com/theory-of-semiconductor/
- 14. https://en.wikipedia.org/wiki/Semiconductor

Course Outcomes

- 1. After studied unit-1, the student will be able to understand the concept of mechanics and to study the different properties of matter
- 2. After studied unit-2, the student will be able to learn about First and second law of thermodynamics and also provided basics of entropy
- 3. After studied unit-3, the student will be able to study the magnetism and magnetic materials
- 4. After studied unit-4, the student will be able to explain the phenomenon of interference, diffraction and polarization and also to describe the fundamentals of laser
- 5. After studied unit-5, the student will be able to demonstrate the atomic structure using Bohr's theory and also derive Einstein's Mass-Energy relation. Also they acquired knowledge on fundamentals of semiconductors.

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OPEN ELECTIVE PAPER-2 (to choose 1 out of 3)

Course Objectives

- 1. The course gives the basics of semiconductors and it will be used to learn different type of semiconductors and can understand the concept of PN junction.
- 2. Rectifiers and amplifiers will be explained to know how it works
- 3. The basics of operational amplifiers are introduced
- 4. The various number systems are introduced and to understand the different codes
- 5. To give an insight to the students about fundamental logic gates

UNIT-1: Basics of Semiconductors

Classification of solids in terms of forbidden energy gap-Fermi level-Intrinsic and extrinsic semiconductors-N-Type and P-Type semiconductors-Forward and Reverse Bias-PN junction-PN junction Diode and Zener Diode-V-I Characteristics-Zener Diode as a Voltage regulator.

UNIT-2: Rectifiers and Amplifiers

Half-wave, Full-wave and bridge rectifier –Transistor-NPN and PNP transistors- Three modes of transistors-CE characteristics of a Transistor-Single stage amplifier-frequency response curve-Feedback amplifier.

UNIT-3: Operational Amplifier Fundamentals

OPAMP –Symbol and Terminals -Parameter-Inverting and Non-inverting amplifier – gain - Virtual ground -Offset voltage- offset current-CMRR.

 $Mathematical\ operations-OPAMP-Sign\ and\ Scale\ changer\ -adder,\ subtractor\ and\ voltage\ follower.$

UNIT-4 :Number systems

Number systems – decimal, binary, octal and hexadecimal system – Conversion from one number system to another. Codes – BCD code – Excess 3 code, Gray code – Binary arithmetic –Binary addition – subtraction – unsigned binary numbers – sign magnitude numbers – 1's and 2's complement.

UNIT-5: Logic gates

Basic Logic gates- AND, OR using diodes- NOT gate using transistor-NAND, NOR and EXOR gates- NAND & NOR as universal gates- De Morgan's theorems and their circuit implications -Half adder- Halfsubtractor.

Text Books

Unit-1 and Unit-2

1. V.K. Mehta and Rohit Mehta, Principles of Electronics, S Chand & Co., Ltd., New Delhi, 2014.

Unit-3 to Unit-5

1. V Vijayendiran, Introduction to Integrated Electronics, Ananda Book Depot, Chennai, 2007.

Reference Books

- 1. Malvino and Leech, Digital Principles and Applications, 4th Edition, Tata McGraw Hill, New Delhi, 2000.
- 2. Millman and Halkias, Integrated Electronics, International Edition, McGraw Hill, New Delhi, 1972.
- 3. M Arul Thalapapathi, Fundamentals of Digital Computers, Comptek publishers, Chennai, 1995.

E-Materials

- 1. https://en.wikipedia.org/wiki/Semiconductor
- 2. <u>https://www.youtube.com/watch?v=CjAVfW_6juw</u>
- 3. https://en.wikipedia.org/wiki/Amplifier
- 4. <u>https://www.youtube.com/watch?v=WZD9RZoMhVE</u>
- 5. <u>https://en.wikipedia.org/wiki/Operational_amplifier</u>
- 6. <u>https://www.youtube.com/watch?v=XmCuCf6GZLY</u>
- 7. https://www.tutorialspoint.com/digital_circuits/digital_circuits_number_systems.htm
- 8. https://www.elprocus.com/basic-logic-gates-with-truth-tables/
- 9. <u>https://www.youtube.com/watch?v=aWp8ILQgudI</u>
- 10. https://www.electrical4u.com/universal-gate-nand-nor-gate-as-universal-gate/

Course Outcomes

- 1. After studied unit-1, the student will be able to understand basics of semiconductors and able to distinguish between N-Type and P-Type semicondutors.
- 2. After studied unit-2, the student will be able to design rectifier circuits using diodes and amplifier circuits using transistors.
- 3. After studied unit-3, the student will be able to perform the various mathematical operations using OP-AMP.
- 4. After studied unit-4, the student will be able to understand the different number systems and to know how to convert one number to another number system.
- 5. After studied unit-5, the student will be able to demonstrate the basic logic gates AND,OR and NOT gates using diodes and transistor and also explain the Universal logic gates using NAND and NOR gates.

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CORE PRACTICAL-1

Name of the course/subject:	M.Sc Ph	ysics	Semester: I& II
Name of the Paper: General P	ractical	Credits:4	
Hours of teaching: 4			Paper type: Core Practical

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(Any 12 out of the given 20)

- 1. Young's modulus -Cornu's method forming elliptical fringes.
- 2. Young's modulus Cornu's method forming hyperbolic fringes.
- 3. Spectrometer-Determination of Cauchy's constants
- 4. Spectrometer Polarizability of liquids.
- 5. Spectrometer Charge of an electron.
- 6. Spectrometer- Biprism Wavelength of monochromatic source Refractive Index of a liquid
- 7. Co-efficient of linear expansion Air wedge method.
- 8. Hydrogen spectrum Rydberg's constant.
- 9. Solar spectrum Hartmann's Interpolation formula
- 10. Viscosity of liquid Meyer's disc.
- 11. Determination of Stefan's constant.
- 12. Determination of solar constant using Lee's Disc.
- 13. Thermistor-Band gap energy.
- 14. Electrical resistance of a metal / alloy as a function of temperature by four probe method.
- 15. Determination of dielectric constant of solid samples
- 16. Determination of dielectric constant at high frequency by Lecher wire.
- 17. Specific charge of an electron -Thomson's method / Magnetron method.
- 18. B-H loop using Anchor ring.
- 19. Permittivity of a liquid using RFO.
- 20. Measurement of Numerical aperture and attenuation characteristics of the optical fibre for variable lengths.

Text Books

- 1. C.C. Ouseph, U.J. Rao, V. Vijayendran, Practical Physics and Electronics, Ananda Book Depot, Chennai, 2018
- 2. M.N.Srinivasan, S. Balasubramanian, R.Ranganathan, A Text Book of Practical Physics, Sultan Chand & Sons, New Delhi, 2015

Reference Books

- 1. Samir Kumar Ghosh, A Textbook of Advanced Practical Physics, NCBA, Kolkatta, 2000
- 2. D. Chattopadyay, P.C.Rakshit, An Advanced Course in Practical Physics, NCBA, Kolkatta, 2011

CORE PRACTICAL-2

Name of the course/s	ubject: M.Sc Physics	Semester: I & II
Name of the Paper:	Electronics Practical	Credits:4
Hours of teaching:4		Paper type: Core Practical

(Any 12out of the given 20)

- 1. Construction of dual regulated power supply.
- 2. V-I characteristics of solar cell.
- 3. OP-AMP-Active 2ndorder filter circuits:Low pass, High pass and Band pass filters.
- 4. OP-AMP- Design of Phase-shift Oscillator-Study of attenuation characteristics
- 5. OP-AMP- Design of Wien Bridge Oscillator-Study of attenuation characteristics.
- 6. OP-AMP Solving simultaneous equations.
- 7. OP-AMP Design of square wave, saw tooth wave, and Triangular wave generators.
- 8. OP-AMP- Design of Schmitt Trigger and construction of Monostablemultivibrator.
- 9. OP-AMP- Instrumentation amplifier
- 10. OP-AMP- Design of Pulse with modulator
- 11. Arithmetic operations (Adder/ Subtractor) Using IC 7483.
- 12. Study of (i) Multiplexer using IC 74150 for the generation of Boolean functions and(ii) Demultiplexer using IC 74154
- 13. Study the function of Decoder and Encoder.
- 14. IC 7490 -as modulus counters and display using IC-7447
- 15. Up-down counters Design of modulus counters.
- 16. IC 7476 4 bit Shift Register Ring counter and Johnson counters.
- 17. IC 555 Astablemultivibrator and Voltage Controlled Oscillator.
- 18. IC 555 Monostablemultivibrator and Frequency Divider.
- 19. IC 555 Schmitt Trigger and Hysteresis.
- 20. IC 555-Temperature co-efficient of resistance
- 21. A/D converter using comparator LM 339.
- 22. Study of A/D converters-4 bit simultaneous A/D converter and successive approximation A/D converter using ADC IC 0801/IC 0804.

Text Books

- 1. C.C. Ouseph, U.J. Rao, V. Vijayendran, Practical Physics and Electronics, Ananda Book Depot, Chennai, 2018
- 2. M.N.Srinivasan, S. Balasubramanian, R.Ranganathan, A Text Book of Practical Physics, Sultan Chand & Sons, New Delhi, 2015

Reference Books

- 1. Samir Kumar Ghosh, A Textbook of Advanced Practical Physics, NCBA, Kolkatta, 2000
- 2. D. Chattopadyay, P.C.Rakshit, An Advanced Course in Practical Physics, NCBA, Kolkatta, 2011

ANNAMALAI UNIVERSITY

BACHELOR OF SCIENCE B.Sc. CHEMISTRY DEGREE COURSE

(2021 - 2022)

The Course of Study and the Scheme of Examinations

		Study Components Course Title		Ins. Hrs / Credit week			Maximum Marks		
S. No.	Part					Title of the Paper			
		SEMESTE	ER I				CIA	Uni. Exam	Total
1	I	Language	Paper-1	6	4	Tamil/Other Languages	25	75	100
2	П	English (CE)	Paper-1	6	4	Communicative English I	25	75	100
3	Ш	Core Theory	Paper-1	6	4	General Chemistry - I	25	75	100
4	III	Core Practical	Practical-1	3	0	Volumetric Analysis	0	0	0
5	111	Allied -1	Paper-1	4	3	 (Choose any 1 out of 5) 1. Physics I 2. Botany I 3. Zoology I 4. Biochemistry I 5. Mathematics I* 	25	75	100
6	Ш	Allied- 1	Practical-1	3	0		0	0	0
7	III	PE	Paper 1	6	3	Professional English I	25	75	100
8	IV	Environmental Studies		2	2	Environmental studies	25	75	100
		Sem. Total		36	20		150	450	600
		SEMESTE	RII				CIA	Uni. Exam	Total
8	1	Language	Paper-2	6	4	Tamil/Other Languages	25	75	100
9	П	English (CE)	Paper-2	6	4	Communicative English II	25	75	100
10	III	Core Theory	Paper-2	5	4	General Chemistry - II	25	75	100
11	Ш	Core Practical	Practical-1	3	2	Volumetric Analysis	25	75	100
12	111	Allied-1	Paper-2	4	3	 (Choose any 1 out of 5) 1. Physics II 2. Botany II 3. Zoology II 4. Biochemistry II 5. Mathematics II* 	25	75	100
12	111	Allied-1 Allied Practical - 1	Paper-2 Practical-1	4	3	 (Choose any 1 out of 5) 1. Physics II 2. Botany II 3. Zoology II 4. Biochemistry II 5. Mathematics II* 	25	75 75	100
12 13 14	 	Allied-1 Allied Practical - 1 PE	Paper-2 Practical-1 Paper 1	4 2 6	3 2 3	 (Choose any 1 out of 5) 1. Physics II 2. Botany II 3. Zoology II 4. Biochemistry II 5. Mathematics II* Professional English II	25 25 25 25	75 75 75	100 100 100
12 13 14 15	 V	Allied-1 Allied Practical - 1 PE Value Education	Paper-2 Practical-1 Paper 1	4 2 6 2	3 2 3 2	 (Choose any 1 out of 5) 1. Physics II 2. Botany II 3. Zoology II 4. Biochemistry II 5. Mathematics II* Professional English II	25 25 25 25 25	75 75 75 75	100 100 100
12 13 14 15 16	 V	Allied-1 Allied Practical - 1 PE Value Education Soft Skill	Paper-2 Practical-1 Paper 1	4 2 6 2 2	3 2 3 2 1	 (Choose any 1 out of 5) 1. Physics II 2. Botany II 3. Zoology II 4. Biochemistry II 5. Mathematics II* Professional English II	25 25 25 25 25 25	75 75 75 75 75 75	100 100 100 100 100
12 13 14 15 16	 V V	Allied-1 Allied Practical - 1 PE Value Education Soft Skill Sem. Total	Paper-2 Practical-1 Paper 1	4 2 6 2 2 36	3 2 3 2 1 25	 (Choose any 1 out of 5) 1. Physics II 2. Botany II 3. Zoology II 4. Biochemistry II 5. Mathematics II* Professional English II	25 25 25 25 25 25 225	75 75 75 75 75 675	100 100 100 100 900

* Allied Mathematics:

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	Ins. Hrs/Week	Credit	CIA	University	Total Marks
Paper-1	6	3	25	75	100
Paper-2	6	5	25	75	100

ANNAMALAI UNIVERSITY

B.Sc., CHEMISTRY SYLLABUS UNDER CBCS (2021 - 2022)

SEMESTER I PAPER – 1 GENERAL CHEMISTRY – I

Objective:

Basic concepts regarding Atomic Structure, Periodic Properties, Bonding Concepts, Ionic Bond, VSEPR and MO Theories, Nomenclature of Organic Compounds, Hybridisation, Reaction Intermediates, States of Matter, Principle of Volumetric Analysis, Related Problems and Applications wherever necessary are to be taught for I- Semester.

Course Outcomes:

Upon completion of this course, the students will be able to

- 1) Recollect the Chemistry of Quantum Numbers.
- 2) Review and apply periodicity of properties.
- 3) Discuss various types of bonding through VB & MO theories.
- 4) Name simple Aliphatic and Aromatic Compounds.
- 5) Illustrate and apply electron displacement effects and reaction mechanisms.
- 6) Elaborate the basic concepts of solid, liquid and gaseous states.
- 7) Apply the principles of Volumetric Analysis.

Course Outcomes:

Upon completion of this course, the students will be able to

- 1) Recollect the Chemistry of Quantum Numbers.
- 2) Review and apply periodicity of properties.
- 3) Discuss various types of bonding through VB & MO theories.
- 4) Name simple Aliphatic and Aromatic Compounds.
- 5) Illustrate and apply electron displacement effects and reaction mechanisms.
- 6) Elaborate the basic concepts of solid, liquid and gaseous states.
- 7) Apply the principles of Volumetric Analysis.

UNIT-I ATOMIC STRUCTURE

1.1 Quantum numbers n, l, m and s – Pauli's exclusion principle – Energy distribution and orbitals - Hund's rule of maximum multiplicity - Aufbau's principle – Electronic Configuration of elements - Stability of Half-filled and completely filled orbitals. Shapes of s, p, d and f orbitals.

1.2 Classification of elements – General characteristics of s, p, d and f- Block elements – Periodicity of properties- Definition and Periodicity of the following properties – Atomic radii and Ionic radii - Factors affecting the Atomic radii and Ionic radii.

1.3 Ionisation potential, Electron affinity and Electronegativity - Factors affecting the Ionisation potential, Electron affinity and Electronegativity – Pauling scale – Mulliken electronegativity scale – Applications of Electronegativity regarding the Bonding nature. Trends in periodic table and applications in predicting and explaining the chemical behavior.

UNIT- II CHEMICAL BONDING

2.1 Ionic bond - Conditions for the formation of ionic bond - General properties – Energetics of formation of NaCl from Na⁺ and Cl⁻ - Hydration energy, Lattice energy and their applications – Born-Haber cycle - Polarisation of ions- Fajan's rule - Transition from ionic to covalent character.

2.2 Covalent bond - Conditions for the formation of covalent bond - General properties -Polarity of bonds - Orbital overlap - Bond lengths and Bond energies - Hybridisation -Sigma and Pi bonds - VSEPR theory - Geometries of BeCl₂, BF₃, NH₃, CH₄, SF₄, ICl₂⁻, H₂O, PCl₅, ClF₃, XeF₆, SF₆ and IF₇ molecules - Partial ionic character of covalent bond -Percentage of ionic character from dipole moment and electronegativity difference.

2.3 Molecular Orbital theory – Bonding and Anti-bonding orbitals - Relative order of

Energies of molecular orbitals - MO diagram of H₂, He₂, O₂, O²⁺, O²⁻, N₂, F₂, HF and CO - Bond Order - Stability and Magnetic properties of the molecules - Comparison of VB and MO theories. Hydrogen bonding-types, examples and effect on properties.

UNIT- III BASIC CONCEPTS OF ORGANIC CHEMISTRY

3.1 Classification of Organic Compounds - Nomenclature of Organic Compounds -

Functional Groups - Homologous Series - IUPAC Recommendations for Naming Simple Aliphatic and Alicyclic Compounds.

3.2 Basic concepts of bonding in organic chemistry - Hybridisation – Definition – Geometry of Molecules - Methane, Ethane, Ethylene, Acetylene and Benzene - Electron displacement effects - Inductive - Inductomeric - Electromeric – Mesomeric Effect - Resonance - Hyperconjugation and Steric Effects.

3.3 Cleavage of bonds - Homolytic and Heterolytic fission of carbon-carbon bond – Methods to determine the Reaction Mechanism - Reaction intermediates - Structure and Stability of Carbocations, Carbanions and Free radicals.

UNIT-IV STATES OF MATTER

4.1 Gaseous state - Kinetic gas equation - Postulates and Derivation - Gas laws from the kinetic gas equation - Kinds of velocities - Mean, RMS, Most Probable Velocities - Calculation of molecular velocities - Maxwell's distribution of Molecular Velocities (No derivation) - Effect of Temperature on velocity distribution - Equipartition of energy - Heat capacity on molecular basis - Virial equation of state - Boyle temperature - Coefficient of Compressibility and Thermal expansion.

4.2 Liquid state - Density – Diffusion - Viscosity – Evaporation - Surface tension Determination using Stalagmometer - Effect of temperature on surface tension - Parachor - Definition and Applications only - Coefficient of Viscosity- determination using Oswald's Viscometer-Effect of Temperature and Pressure - Liquid crystals - Classification and Applications.

4.3 Solid State - Crystal lattices - Symmetry elements in crystals - Unit cell- Seven crystal systems - Space lattice - Bravais lattices - Laws of Crystallography-law of constancy of inter facial angles and Rational Indices- Miller indices, X-ray diffraction by crystals.

UNIT-V PRINCIPLES OF VOLUMETRIC ANALYSIS

5.1 Definitions of Molarity, Molality, Normality and Mole Fraction – Their Calculations - Definition and Examples for Primary and Secondary standards - Calculation of Equivalent Weight of Acid, Base, Oxidising Agent, Reducing Agent and Salts.

5.2 Principles of Volumetric Analysis - Theories of Acid- Base, Redox, precipitation titrations, Complexometric Iodometric and Iodimetric titrations.

5.3 Theories of indicators - Choice of indicators - Acid-base indicators - Redox, Metal ion and Adsorption indicators.

ALLIED 1

(to choose one out of 5) PAPER-1

1. PHYSICS I

Course Objectives

- 1. To understand the basics of gravitation and to study the properties of matter.
- 2. To learn the law of thermoelectric circuits and thermoelectric diagrams.
- 3. To teach the growth and decay of a transient current and magnetometer.
- 4. To explain production of ultrasonics and reverberation time.
- 5. To know the basics of laser and fibre optics principles and applications.

UNIT-1: Properties of Matter

Gravitation: Acceleration due to gravity -Determination of 'g' by Simple pendulum - Drawbacks of simple pendulum –Determination of time period of compound pendulum - 'g' by compound pendulum -Centre of Oscillation and Centre of Suspension are interchangeable-Determination of 'g' by Bar/compound pendulum.

Elasticity: Bending of beams -Expression for bending moment - Cantilever Depression at the loaded end of a cantilever Expression forYoung's modulus -non–uniform bending-Pin and microscope method.

Torsion : Torsion couple – Potential energy in a twisted wire – Torsional pendulum – Time period - Determination of rigidity modulus by Torsional oscillation (without masses).

Viscosity: Viscosity of a liquid -Viscous force - Co-efficient of viscosity of a liquid – Poiseuille's formula -Experimental method using Burette- Effect of temperature and pressure on viscosity-applications.

Surface Tension: Surface tension of a liquid-Surface Tension and interfacial surface tension by the method of drops-applications.

UNIT-2: Thermo Electricity

Seeback, Peltier and Thomson effects - laws of thermoelectric circuits -Peltier coefficient - Thomson coefficient -application of thermodynamics to a thermocouple and expressions for Peltier and Thomson coefficients -thermo electric power and thermo electric diagrams.

UNIT-3: Transient Current and Magnetism

Growth and decay of current in a circuit containing resistance and inductance- Growth and decay of charge in circuit containing resistance and capacitor - growth and decay of charge in a LCR circuit – condition for the discharge to be oscillatory – frequency of oscillation.

Magnetism -Magnetic moment and pole strength of a magnet – Deflection magnetometer – Tan C

Position- Vibration magnetometer – Theory – Period of Oscillation – Determination of M and $B_{\rm H}$ using the deflection magnetometer and the vibration magnetometer .

UNIT -4: Acoustics

Sound: Transverse vibration of strings -Velocity and frequency of vibrations of a stretched string - laws -Sonometer -A.C. Frequency - Steel wire- Brass wire.

Introduction to Ultrasonics – Piezo electric effect–production by Piezo electric method – properties –applications- Acoustics of buildings – reverberation time – derivation of Sabine's formula – determination of absorption coefficient-Acoustic aspects of halls and auditoria.

UNIT-5:Lasers and Fibre Optics

Laser: Introduction - Principles of laser -Einstein's explanation for stimulatedemission – Differences between stimulated and spontaneous emission - Population inversion –Properties of laser -Types of lasers - He- Ne Laser - Semiconductor Laser-Applications of laser.

Fibre optics: Basic principle of an optical fibre -Total internal reflection -Basic structure of an optical fibre -Numerical aperture –Coherent bundle – Attenuation and dispersion - classification of optical fibres-step index and graded index fibers – single mode and multi mode fibers-Fibre optic communication system block diagram.-applications.

Text Books

Unit 1 and Unit 4

1. R. Murugesan and KiruthigaSivaprasath, Properties of Matter and Acoustics, S. Chand & Co. New Delhi, Kindle edition.

Unit 2 and Unit 3

1. R. Murugesan, Electricity & Magnetism, S. Chand & Co. New Delhi, 2019.

Unit 5

1. N Subrahmanyam, BrijLal and M.N Avadhanulu, A Text Book of Optics, S. Chand &Co. New Delhi, Revised Edition as per UGC model syllabus.

Reference Books

- 1. BrijLal and N Subrahmanyam, Electricity and Magnetism, S Chand & Company Pvt Ltd, New Delhi, 2000.
- 2. D.C. Tayal, Electricity and Magnetism, Himalaya Publishing House, Bombay, 2014.
- 3. BrijLal and N.Subrahmanyam, A Text Book of Sound, Vikas Publications, New Delhi (2 Edition)

- 4. C.L.Arora, Physics for Degree Students B.Sc First Year, S. Chand Publishing, 2013.
- K.Thyagarajan and Ajay Ghatak, Introduction to Fibre optics-, Cambridge University.
- Ajay Ghatak and K.Thyagarajan, Fiber optics and Lasers-The two revolutions, Macmillan, 2006.
- 7. K.Thyagarajan and Ajay Ghatak, Lasers; Fundamentals and applications, Springer.
- 8. Modern Physics R, Murugeshan, KiruthigaSivaprasath, S.Chand&Co, New Delhi, 2016.

E-MATERIALS

- 1. <u>https://courses.lumenlearning.com/physics/chapter/16-4-the-simple-pendulum/</u>
- 2. <u>https://www.youtube.com/watch?v=aw0_seEt4v0</u>
- 3. <u>https://en.wikipedia.org/wiki/Thermoelectric effect</u>
- 4. <u>https://www.youtube.com/watch?v=S0I37M2sx_0</u>
- 5. <u>https://physicscatalyst.com/elecmagnetism/growth-and-delay-charge-R-C-circuit.php</u>
- 6. <u>https://www.youtube.com/watch?v=PLQQPXot6vE</u>
- 7. <u>https://www.youtube.com/watch?v=d0_Eff4MXwM</u>
- 8. https://www.techglads.com/cse/sem1/production-of-ultrasonics-by-piezoelectric-methods/
- 9. https://thefactfactor.com/facts/pure_science/physics/optical-fibre/5159/
- 10. <u>https://www.youtube.com/watch?v=auk1OS0SVWc</u> (Tamil video)

Course Objectives

- 1. After studied unit-1, the student will be able to find the acceleration due to gravity at a place using simple pendulum and compound pendulum. Also can know the properties of matter like elasticity, viscosity and surface tension.
- 2. After studied unit-2, the student will be able to learn thermo emf using Seebeck and Peltier effects and hence understand thermoelectric circuits.
- 3. After studied unit-3, the student will be able to explain growth and decay of a transient current in a circuit containing resistance-inductance, resistance-capacitance and LCR in series. Also will be able to determine the horizontal components of earth's magnetic induction at a place using deflection magnetometer in Tan C position.
- 4. After studied unit-4, the student will be able to derive the expression for the velocity of a sound in a stretched string and hence they can determine the frequency of A.C mains.
- 5. After studied unit-5, the student will be able to understanding the principle of laser and can demonstrate the working of He-Ne laser and applications of laser. Also, the student will be able to learn the fibre optics, structure and application in communication.

ALLIED 1

PAPER-1

2. BOTANY - I

UNIT-I: Cell Biology

Prokaryotic and Eukaryotic cell (plant cell) Cell organells - Chloroplast, Mitochondrion and Nucleus. Cell division – Mitosis.

UNIT-II: Anatomy

Tissues - Meristematic and permanent tissues. Primary and Normal Secondary thickening of Dicot stem.

UNIT-III: Bacteria and Viruses

Bacteria - General characters - shape - flagellation - Structure of E. Coil - reproduction - (Vegetative and asexual), Economic importance. Structure of Tobaco Mosaic Virus, Bacteriophage.

UNIT-IV: Structure and Life History of

a) Chlorella and Gracilariab) Albugo, Penicilium and Agaricus

UNIT-V: Structure and Life History of

a) Funariab) Lycopodiumc) CycasEconomic importance of Chlorella, Penicillium and Agaricus.

ALLIED 1

PAPER-1

3. ZOOLOGY I

Objective;

To acquire knowledge about different kinds of animals species.

To study the systematic and functional morphology of invertebrates and chordates.

UNIT-I

Type study includes life history.

Protozoa – entamoeba, Porifera- Sycon. Coelenterata – Obelia geniculata. Platyhelminthes - Teania solium.

Unit II

Annilida – earthworm , Arthropoda – Prawn, Mollusca – Freshwater Mussel, Echinodermata – Sea Star.

UNIT-III

Type study includes morphology, digestive system, respiratory system, circulatory system and urinogenital system of Chordate. Chordate – general characters, Prochordata; morphology of Amphioxus. Vertebrates; Pisces –Shark.

UNIT-IV

Amphibia; Frog, Reptiles; calotes.

UNIT-V

Aves; Pigeon, Mammalia; Rabbit.

References;

1.Ayyar, E.K. and T.N. Ananthakrishnan. 1992. Manual of Zoology. Volume I & I, S. Viswanathan (printers and publishers) Pvt. Ltd., Madras, 891 p.

2. Kotpal series, 1998 – 1992. Rastogi publications, Meerut.

3. Jordan E.L. and P.S. Verma. 1993. Invertebrate Zoology 12th edition, S. Chand & Co., Ltd., New Delhi.

4. Jordan, E.L. and P.S. Verma. 1995. Chordate Zoology and Elements of Animal physiology, S. Chand & Co., Ltd., New Delhi.

Outcomes;

- 1. The students will be able to understand the life cycle to and adaptations of protozoa, porifera coelenterata and platy helminthes.
- 2. The student will be able to understand the functional morphology of Annelids, Arthropods, Molluscs and Echinoderms.
- 3. The student will be able acquire knowledge about the functional morphology of chordata, prochordatas and pisces.
- 4. The student will be able have a thorough knowledge about Frog and Calotes.
- 5. The student will be able to understand the functional morphology of Aves and Mammals.

ALLIED - 1

PAPER – 1

4. BIOCHEMISTRY I

OBJECTIVE:

To acquire knowledge on the structure and functions of biomolecules

At the end of the course, the students will be able to

CO1	Explain the structure, biological importance of carbohydrates, from monosaccharides to polysaccharides
CO2	Identify the structure and classification of amino acids,
CO3	Classify proteins and explain their properties
CO4	Define and classify lipids with examples, explain the properties of fats and describe the structure and biological functions of phospholipids, glycolipids and sterols
CO5	Illustrate the structure of nucleotides, distinguish DNA and RNA and describe the structure of DNA, types of RNA and their biological functions

UNIT-I: Carbohydrates

Definition and Classification of carbohydrate. Monosaccharides–Glucose, Fructose and Arabinose, Linear and ring forms (Haworth formula)for glucose and fructose. Anomer, epimer and enatiomers-Definition with examples. Disaccharides –Definition- Sucrose, maltose and Lactose occurrence, structure and functions. Polysaccharides –Homopolysaccharides -Starch -Structure and functions. Heteropolysacharides-Aminosugars and sugar acids.

UNIT-II: Amino acids

Definition and classification of amino acids. Reaction of amino acids with ninhydrin, Color reactions of amino acids (Xanthoproteic test, Morners test, Millons test, Sakaguchi test, Lead acetate test and Pauly's test), Amphoteric nature, isoelectric pH and Zwitter ion.

UNIT-III: Proteins

Proteins-Definition. Peptide bond formation. Classification of proteins based on solubility, shape and size. Denaturation. Structure of protein: primary, secondary, tertiary and quaternary structure.

UNIT-IV: Lipids

Definition, classification and functions of lipids. Occurrence, chemistry and biologicalfunctions of simple lipids, compound lipids (e.g. phospholipids) and derived lipids:steroids (e.g. cholesterol). Physical property-emulsification. Chemical property-saponification. Functions of bile acids and bile salts.

UNIT- V: Nucleic acids

Nucleic acid- Composition of nucleic acid. Definition - nucleoside, nucleotide and polynucleotide. Double helical model of DNA its biological functions. Chargaff's rule. RNA-Structure, types and functions of RNA: tRNA, mRNA and rRNA. Differences between DNA and RNA

REFERENCES

- J. L. Jain, Nitin Jain, Sunjai Jai., Fundamentals of Biochemistry 7th editionS. Chand @ Co.Ltd .,2016
- 4. U. Satyanarayanan BiochemistryElseiver 2017
- David.L.Nelson, Michael. M.Cox Lehninger principles of Biochemistry 7theditionFreeman. W.H. and Company2017
- 6. Victor Rodwell Harper's Illustrated Biochemistry McGrew. Hill 2018

ALLIED 1

PAPER-1

MATHEMATICS – I

Objectives of the Course:

To Explore the Fundamental Concepts of Mathematics

UNIT-I: ALGEBRA

Partial Fractions - Binomial, Exponential and logarithmic Series (without Proof) - Summation - Simple problems

UNIT-II : THEORY OF EQUATIONS

Polynomial Equations with real Coefficients - Irrational roots - Complex roots-Transformation of equation by increasing or decreasing roots by a constant - Reciprocal equations - Newton's method to find a root approximately - Simple problems.

UNIT-III : MATRICES

Symmetric - Skew-Symmetric - Orthogonal and Unitary matrices - Eigen roots and eigen vectors – Cayley - Hamilton theorem (without proof)-Verification and computation of inverse matrix

UNIT-IV: TRIGONOMETRY

Expansions of $\sin^n \theta$, $\cos^n \theta$, $\sin n\theta$, $\cos n\theta$, $\tan n\theta$ - Expansions of $\sin \theta$, $\cos \theta$, $\tan \theta$ in terms of θ .

UNIT-V: DIFFERENTIAL CALCULUS

Successive differentiation upto third order, Jacobians -Concepts of polar coordinates-Curvature and radius of curvature in Cartesian co-ordinates and in polar coordinates.

Recommended Text:

P.Duraipandian and S.Udayabaskaran,(1997) *Allied Mathematics*, Vol. I & II.Muhil Publishers, Chennai.

Reference Books:

- 1. P.Balasubramanian and K.G.Subramanian,(1997) *Ancillary Mathematics*. Vol. I & II. Tata McGraw Hill, New Delhi.
- 2. S.P.Rajagopalan and R.Sattanathan,(2005) *Allied Mathematics* .Vol. I & II. VikasPublications, New Delhi.
- 3. P.R.Vittal (2003) Allied Mathematics .Marghan Publications, Chennai
- 4. P.Kandasamy, K.Thilagavathy (2003) Allied Mathematics Vol-I, II S.Chand& company Ltd., New Delhi-55.
- 5. Isaac, Allied Mathematics. New Gamma Publishing House, Palayamkottai.

SEMESTER II

PAPER-2

GENERAL CHEMISTRY - II

OBJECTIVES:

• Basic knowledge on s- and p- Block Elements, Group Study, Hydrocarbons, Cycloalkanes, Dienes, Quantum Chemistry, Thermochemistry, First Law of Thermodynamics, Derivation of Equations, Related Problems, Reaction Mechanism and Applications wherever necessary are to be taught for II- Semester.

Course Outcomes:

Upon completion of this course, the students will be able to

- 1) Compare the basic properties of elements and their Compounds of s & p block elements.
- 2) Explain the reaction mechanisms of alkanes, alkenes and alkynes and predict the products.
- 3) Classify dienes and analyze the stability of alkanes, alkenes and cycloalkanes.
- 4) Recollect the basic concepts of Quantum Theory and Thermodynamics.
- 5) Calculate the thermodynamic parameters using thermo chemical equations and data.

UNIT-I s- and p- Block Elements

1.1 Alkali metals - Li, Na, K, Rb and Cs - Occurrence - Comparative study of Elements with respect to Oxides, Halides, Hydroxides and Carbonates - Exceptional property of Lithium - Diagonal Relationship of Li with Mg.

1.2 Alkaline earth metals - Be, Mg, Ca, Sr and Ba - Occurrence - Comparative study of the elements with respect to Oxides, Hydroxides, Halides, Sulphates and Carbonates - Exceptional property of Beryllium - Diagonal relationship of Be with Al - Comparison of Alkaline Earth Metals with Alkali Metals - Magnesium acting as bridge element between II A and II B groups - Magnesium resembles Zinc.

1.3 p- Block elements - Boron family - Group discussion - Anomalous behaviour of Boron - Diagonal Relationship between Boron and Silicon - Electron deficiency and Electron acceptor behaviour of Boron trihalides - Bonding in Diborane (Hydrogenbridge structure) - Preparation, Properties, structure and Uses of Borazine,NaBH₄, LiAlH₄ and boron nitride.

UNIT-II HYDROCARBONS

2.1 Alkanes - Methods of preparation of alkanes - Wurtz method, Kolbe's method and Reduction of alkyl halides - Physical and Chemical Properties of alkanes - Mechanism of Free Radical Substitution in alkanes – Halogenation and Reactivity.

2.2 Alkenes - Properties of alkenes – Electrophilic and Free radical addition - Addition reactions of Alkenes with mechanism - Addition of Hydrogen, Halogens,

Hydrogen Halide (Markownikoff's rule) - Hydrogen bromide (Peroxide effect) - Sulphuric Acid, Water, BH_3 , Ozonolysis, Hydroxylation with $KMnO_4$ - Allylic substitution by NBS.

2.3 Alkynes - Acidity of alkynes - Addition of hydrogen - Hydroboration - Hydrohalogenation - Addition of hypohalous acid, Hydration - Addition of water with HgSO₄ catalyst - Oxidation with KMnO₄ - Ozonolysis - Formation of Acetylides.

UNIT-III DIENES AND CYCLOALKANES

3.1 Dienes – Classification - Conjugated, Isolated and Cumulative Dienes - Stability of

Dienes - 1, 2- and 1, 4- Addition reactions of H_2 and HX with mechanisms – Synthesis of dienes – 1, 3 - Butadiene, Isoprene and Chloroprene - Diels-Alder reaction.

- **3.2** Cycloalkanes Preparation using Wurtz's reaction, Dieckmann's ring closure and Reduction of aromatic hydrocarbons Substitution and Ring opening reactions.
- **3.3** Stability of Alkanes, Alkenes and Cycloalkanes Bayer's strain theory Theory of Strainless rings.

UNIT-IV QUANTUM CHEMISTRY AND THERMOCHEMISTRY

4.1 Planck's Quantum theory of radiation - Photoelectric Effect - Compton Effect - Wave mechanical concept of the atom - de Broglie's relationship – Davisson and Germer experiment - Wave nature of electron - Heisenberg's Uncertainty Principle.

4.2 Schrodinger wave equation (Without derivation) - Significance of wave functions ψ and ψ^2 - Shapes of s, p and d- orbitals.

4.3 Thermodynamics - Definition and Explanation of terms - System, Boundary, Surroundings - Homogeneous and Heterogeneous systems – Open, Closed and Isolated systems -Intensive and Extensive properties - State of a system - Independent state variables - Dependent state variables - Thermodynamic functions - State and Path functions.

UNIT-V THERMODYNAMICS

5.1 Thermodynamic processes - Types of processes - Cyclic - Reversible – Irreversible - Isothermal – Adiabatic Process - Exact and Inexact Differentials - Concept of Heat and Work - Zeroth Law of Thermodynamics.

5.2 First law of Thermodynamics - Statement and Equation $-C_p$ and C_v Relationship - Calculation of w, q, ΔE and ΔH for the Expansion of Ideal Gases under Reversible, Isothermal and Adiabatic Conditions.

5.3 Thermochemistry - Heat of a reaction - Exothermic and Endothermic reactions - Calculation of ΔH from ΔE and vice versa - Thermochemical equations - Bond dissociation energy - Calculation from thermochemical data - Variation of Heat of a reaction with temperature - Kirchoff's Equation and Its significance.

CORE PRACTICAL

Paper – 1

VOLUMETRIC ANALYSIS

Acidimetry

- 1. Estimation of Borax Standard Sodium Carbonate
- 2. Estimation of Sodium Hydroxide Standard Sodium Carbonate
- **3.** Estimation of HCl Standard Oxalic Acid.

Iodometry

- 4. Estimation of Copper Standard Copper Sulphate
- 5. Estimation of Potassium Dichromate Standard Potassium Dichromate

Complexometry

- 6. Estimation of Magnesium using EDTA.
- 7. Estimation of Zinc using EDTA

Dichrometry

8. Estimation of Ferrous Iron using Diphenyl amine / N- pPhenylanthranillic acid as indicator.

Precipitation titration

9. Estimation of Chloride in neutral medium (Demonstration experiment).

Permanganometry

- 10. Estimation of Ferrous Sulphate Standard FAS.
- 11. Estimation of Oxalic Acid Standard Oxalic Acid.
 - Students must write Short Procedure for the given estimation in Ten Minutes during the examination and submit the Paper for Evaluation.

ALLIED 1 PAPER-2

1. PHYSICS II

Course Objectives

- 1. To study the concept of special theory of relativity.
- 2. To expose the structure of atom with different models.
- 3. To know the definition of binding energy and to study about nuclear models
- 4. To learn the different number system in digital electronics and logic gates
- 5. To give an introduction about nanomaterial.

UNIT-1: Special Theory of Relativity

Frames of reference-inertial frames and non-inertial frames -Galilean transformations -Michelson-Morley experiment-interpretation of results - postulates of special theory of relativity Lorentz transformation equations -length contraction - time dilation transformation of velocities -variation of mass with velocity -Mass-energy equation.

UNIT-2: Atomic Physics

Bohr atom model – Critical Potentials - Experimental determination of critical potentials -Franck and Hertz's experiment -Sommerfield's Relativistic atom model The vector atom model – spatial quantization–spinning of an electron –quantum numbers associated with the vector atom model – coupling schemes –LS and jj coupling – the Pauli's exclusion principle – Stern and Gerlach experiment

UNIT-3: Nuclear Physics

Binding energy-Binding energy per nucleon-Packing fraction-Nuclear models – liquid drop model – semi empirical mass formula – merits and demerits -shell model -evidences for shell model – nuclear radiation detectors –ionization chamber – G.M Counter-Wilson cloud chamber-Particle accelerators-Cyclotron-Betatron.

Unit-4: Digital Electronics

Number systems -Decimal, Binary, Octal and Hexadecimal system – Conversion from one number system to another- Binary Arithmetic -Addition –Subtraction- 1's and 2's complement -Binary codes- BCD code – Excess 3 code, Gray code.

NAND, NOR and EXOR – functions and truth tables. NAND & NOR as universal gates-Half adder and Full adder - Half subtractor and Full subtractor using NAND gate only.

UNIT-5: Nanomaterial

Introduction-Nanomaterial- Properties of nanomaterial (size dependent) -synthesis of

nanomaterial- sol gel- hydrothermal method-Scanning Electron Microscope (SEM)- Principle and Instrumentation-Fullerenes- Carbon nanotubes- Fabrication and structure of carbon nanotubes - Properties of carbon nanotubes (Mechanical and Electrical) - Applications of CNT's.

Text Books

Unit 1 to Unit 3

Modern Physics – R, Murugeshan, KiruthigaSivaprasath, S.Chand&Co, New Delhi, 2016

Unit 4

1. V.Vijayendran, Introduction to Integrated Electronics (Digital & Analog), S. Viswanathan, Printers & Publishers Private Ltd, Chennai, 2007

Unit 5

1. V. Raghavan, *Material Science and Engineering*, Printice Hall India., 2004.

Reference Book

- 1. Allied Physics R. Murugesan S. Chand & Co. New Delhi, 2005.
- 2. A Text book of Digital electronics R.S.Sedha, S.Chand&Co, 2013
- 3. Malvino and Leech, Digital Principles and Application, 4th Edition, Tata McGraw Hill, New Delhi, 2000.
- 4. Dr. M.N. Avadhanulu, Material science, S.Chand& Company, New Delhi, 2014.
- 5. M.Arumugam, *Material science*, Anuradhapuplishers, 1990.
- 6. V. Rajendran, *Material Science*, Tata McGraw Hill Ltd, New Delhi, 2001.
- 7. D.C.Tayal, Nuclear Physics, Himalaya Publishing House, 2009

E-MATERIALS

- 1. <u>https://en.wikipedia.org/wiki/Galilean_transformation</u>
- 2. <u>https://www.youtube.com/watch?v=NH3_lIkSB9s</u>
- 3. <u>https://www.youtube.com/watch?v=EEWuUst2GK4</u>
- 4. <u>https://en.wikipedia.org/wiki/Vector_model_of_the_atom</u>
- 5. https://www.tutorialspoint.com/what-is-a-geiger-muller-counter
- 6. <u>https://www.youtube.com/watch?v=jxY6RC52Cf0</u>
- 7. <u>https://www.tutorialspoint.com/digital_circuits/digital_circuits_number_systems.htm</u>
- 8. <u>https://www.youtube.com/watch?v=4ae9sJBBkvw</u>
- 9. <u>https://en.wikipedia.org/wiki/Nanomaterials</u>
- 10. <u>https://www.youtube.com/watch?v=mPxoJz6treE</u> (Tamil video)

Course Outcomes

1. After studied unit-1, the student will be able to study the frames of reference, Galilean transformation equations and special theory of relativity.

- 2. After studied unit-2, the student will be able to describe the different atomic models and Stern and Gerlach Experiment.
- 3. After studied unit-3, the student will be able to explain binding energy, liquid drop model, G.M counter and particle accelerators.
- 4. After studied unit-4, the student will be able to know the conversion of number systems from one to other and also will be able to design universal gates using NAND and NOR gates.
- 5. After studied unit-5, the student will be able to understanding the basics of nanomaterial, synthesis and its applications.

ALLIED PRACTICAL- PHYSICS

List of Experiments (Any 12 Experiments only)

- 1. Determination of 'g' using Compound pendulum.
- 2. Young's modulus-Non-Uniform bending-Pin & microscope
- 3. Rigidity Modulus Torsional oscillation method (without masses).
- 4. Rigidity Modulus Static Torsion method using Scale and Telescope.
- 5. Surface tension and Interfacial Surface tension by Drop Weight method.
- 6. Sonometer Frequency of a Tuning fork.
- 7. Sonometer Determination of A.C. frequency- using steel and brass wire
- 8. Air Wedge Determination of thickness of a thin wire
- 9. Newton's Rings Radius of Curvature of a convex lens.
- 10. Spectrometer Refractive index of a liquid Hollow prism.
- 11. Spectrometer grating Minimum Deviation- Wavelength of Mercury lines.
- 12. Potentiometer Calibration of Low range voltmeter.
- 13. Deflection magnetometer and Vibration magnetometer-Tan C Position-Determination of

m and B_{H} .

- 14. Figure of merit- Table galvanometer.
- 15. Construction of AND, OR gates using diodes and NOT gate using a transistor.
- 16. NAND/NOR as universal gate.
- 17. Half adder and Full adder using NAND gate.
- 18. Half subtractor and Full subtractor using NAND gate.
- 19. Lasers: Study of laser beam parameters.
- 20. Measurement of Numerical aperture (NA) of a telecommunication graded index optic fiber.
- 21. Fiber attenuation of a given optical fiber.

Text Books

- 1. C.C. Ouseph, U.J. Rao, V. Vijayendran, Practical Physics and Electronics, S. Viswanathan, Printers & Publishers Private Ltd, Chennai, 2018.
- 2. M.N.Srinivasan, S. Balasubramanian, R.Ranganathan, A Text Book of Practical Physics, Sultan Chand & Sons, New Delhi, 2015.

Reference Books

- 1. Dr. S. Somasundaram, Practical Physics, Apsarapublications, Tiruchirapalli, 2012.
- 2. R. Sasikumar, Practical Physics, PHI Learning Pvt. Ltd, New Delhi, 2011.

ALLIED 1 PAPER-2

2. BOTANY II

UNIT-I: Taxonomy

General outline of Bentham and Hooker's system of classification. Study of the range of characters and economic importance of the following families: Annonaceae, cucurbitaceae, Apocynaceae, Euphorbiaceae and Liliaceae.

UNIT-II: Embryology

Structure of mature anther. Structure of mature ovule and its types. Fertilization.

UNIT-III: Plant Physiology & Plant Tissue Culture

Physiological role of micro and macro elements their deficiency symptoms Photosynthesis - lightreaction - Calvin cycle Respiration - Glycolysis - Kreb's cycle electron transport system. Growth hormones – Auxins. Tissue culture and its principles.

UNIT-IV: Ecology

Ecosystem - fresh water ecosystem. Environmental pollution. Major pollutants - types of pollution - Air pollution, water pollution, soil pollution - control measures.

UNIT-V: Genetics & Evolution

Mendelism - Monohybrid and dihybrid crosses. Theories of evolution - Lamarckism, Darwinism.

ALLIED PRACTICAL BOTANY – I & II

Description of plants in technical terms belonging to the families mentioned in the theory part.

To study the internal structure of Anatomy material, Pteridophytes and Gymnosperms. Identification and Description of Micro Preparation materials mentioned in the theory part.

Description of experimental setup of plant physiology.

BOOKS SUGGESTED

Ashok Bendre, A.K. and Pandey P.C. (1975) Introductory Botany. Rastogi Publication Meerut.

Ganguly, A.K. and Kumar. N.C. (1971) General Botany Vol. I & Vol. II, Emkay Publication, Delhi.

Rev. Fr. Ignacimuthu, S.J. (1975) Basic Biotechnology – Tata Mcraw till publication co., New Delhi.

Rao, K.N. Krishnamoorthy, K.V. and Rao. G. (1975) Ancillary Botany. S. Viswanathan Private. Ltd., Chennai.

ALLIED 1 PAPER-2 3. ZOOLOGY II

Objective;

-To study the principles of Cell biology and Genetics.

- To study the principles of Developmental Biology and Physiology.
- To have a complete knowledge about circulatory systems and excretory system.
- To create awareness towards recent changes in the environment and preventive measures.
- To understand the concepts of origin of life.

UNIT-I

Cell Biology – structure of animal cell, Genetic; molecular structure of gene – gene function, sex linked inheritance. Genetic engineering and its application.

UNIT-II

Embryology - cleavage and gastrulation of Amphioxus.

Human Physiology; Digestion, circulation – blood components, structure of heart, heart function.

UNIT-III

Disease of Circulatory system – blood pressure, heart disease – Ischemia, Myocardial infarction, Rheumatic heart disease, stroke.

Excretion - structure of kidney and mechanisms of urine formation.

UNIT-IV

Environmental Biology – Biotic factors and Abiotic factors, food chain and food web. Pollution – Environmental Degradation, (Air, Water and Land) – Green house effect – Bioremediation, - Global warming – acid rain.

UNIT-V

Evolution; Theories of Lamarkism & Darwinism.

Reference;

- 1. Ekambaranatha Ayyar, and Ananthakrishnan, T.N. 1993. Outlines of Zoology, Vol I & II, Viswanathan and Co, Madras.
- 2. Sambasiviah, I, Kamalakara Rao, A.P., Augustine Chellappa, S. 1983. Text book of Animal Physiology, S. Chand & Co., New Delhi.

- 3. Verma and Agarwal. 1983. Text book of animal Ecology, S. Chand & Co., New Delhi.
- 4. Verma and Agarwal and Tyagi. 1991. Chordate Embryology, S. Chand & Co., New Delhi.
- 5. Rastogi and Jayaraj. 2000. Taxt book of genetics. Rastogi publications, Meerut.
- 6. Verma and Agarawal. 2000. Cell Biology, Genetics, Molecular Biology, Evolution and Ecology, S. Chand & Co., New Delhi.

Outcomes;

- 1. The student will acquire knowledge about cell structure, gene function and Genetic engineering.
- 2. The student will be able to understand the cleavage pattern and gastrulation in Amphioxus.
- 3. The students will have a thorough knowledge about the diseases of circulatory systems and urine formation.
- 4. The student will be have an awareness about the environment.
- 5. The student will understand the basic concepts of evolution.

ALLIED PRACTICAL

ZOOLOGY

I MAJOR PRACTICAL

DISSECTIONS

Cockroach; Digestive and nervous system

Prawn; nervous system

II MINOR PRACTICAL

MOUNTING

- 1. Mouth parts of Mosquito and Honey bee
- 2. Earthworm Body setae
- 3. Placoid scales of Shark

III SPOTTERS

Entamoeba, Sycan, Obelia, Taenia solium (entire, scolex) earthworm (entire, Pineal setae) Prawn (entire), Fresh water mussel, Sea star, Amphioxus – Entire, Amphioxus – T.S. through pharynx, Shark, Frog, Calotes, Pigeon, feathers of pigeon and Rabbit.

Sphygnomanometer, Stethoscope, Rain gauge.

References;

1.verma. P.S. 2011. A manual of practical Zoology – INVERTEBRATES. Chand & Co., Ltd., Ram Nagar, New Delhi.

2. Verma. P.S. 2011. A manual of practical Zoology – CHORDATES. Chand & Co., Ltd., Ram Nagar, New Delhi.

ALLIED 1 PAPER-2

4. BIOCHEMISTRY II

OBJECTIVE:

To acquire a wide knowledge on metabolism, disorders of metabolism and biological functions of vitamins and minerals

At the end of the course, the students will be able to

CO1	Illustrate the reactions of various metabolic pathways
CO2	Acquire knowledge on the various metabolic disorders
CO3	Classify enzymes and explain their functions
CO4	Define and classify vitamins with examples, explain the sources, RDA and functions of fat soluble and water soluble vitamins
CO5	Illustrate the sources, RDA and functions of minerals

UNIT-I: Metabolism

Metabolism-Catabolism and anabolism-Definition. Reactions of glucose oxidation-Glycolysis, TCA cycle and its energetics, HMP shunt and its significance. Amino acidtransamination and Deamination, reaction, Urea cycle-Formation of urea.

UNIT-II: Metabolic Disorders

Diabetes mellitus- definition. Types and symptoms. Glycogen storage diseases-Types, Renal Glycosuria-Definition and causes. In born errors of amino acid metabolism- Phenylketonuria, Alkaptonuria (Black urine syndrome) and albinism

UNIT-III: Enzymes

Enzymes-Definition, IUB system of classification with one example. Mechanism of enzyme action- Lock and key mechanism, Induced Fit theory. Michaleis-Menton equation. Coenzymes- Vitamins as coenzymes (Tabulation of Coenzymes with functions in metabolism)

UNIT-IV: Vitamins

Vitamins- fat soluble (Vitamin A, D, E and K) and water soluble vitamins (Vitamin B1, B2, B3 and B12), Vitamin C - sources, RDA, biological function and deficiency of Vitamins of the above mentioned vitamins

UNIT V-Minerals

Minerals- sources, RDA, biological functions and deficiency of Calcium, Iron, Phosporus, Sodium and potassium. Examples of minerals as cofactors in metabolism.

REFERENCES

- J. L. Jain, Nitin Jain, Sunjai Jai., Fundamentals of Biochemistry 7th edition S. Chand @ Co.Ltd .,2016
- 2. U. Satyanarayanan BiochemistryElseiver 2017
- David.L.Nelson, Michael. M.CoxLehninger principles of Biochemistry 7th editionFreeman. W.H. and Company2017
- 4. Victor RodwellHarper's Illustrated BiochemistryMcGrew. Hill 2018
ALLIED PRACTICAL

PRACTICAL I

BIOCHEMISTRY I & II

CO NUMBER	CO Statement
CO1	Quantify glucose in unknown solution by benedicts method
CO2	Quantify ascorbic acid in lemon by Dichlorophenol indo phenol dye method
CO3	Quantify glycine by Sorenson's formal titration method
CO4	Qualitatively analyze the carbohydrates and amino acids and report the type of
	carbohydrate based on specific tests
CO5	Differentiate the carbohydrates based microscopic examination of the crystal
	structure.

Volumetric Estimation

- 1. Estimation of Glucose by Benedict's method.
- 2. Estimation of Ascorbic acid by 2, 6 dichlorophenol indophenols dye method.
- 3. Estimation of Glycine by Sorenson's formal titration.

A) Qualitative analysis of Carbohydrates

- 1. Qualitative analysis of Glucose,
- 2. Qualitative analysis of Fructose,
- 3. Qualitative analysis of Sucrose
- 4. Qualitative analysis of Maltose,
- 5. Qualitative analysis of Starch

B) Qualitative analysis of Amino acids

- 1. Qualitative analysis of Arginine,
- 2. Qualitative analysis of Cysteine,
- 3. Qualitative analysis of Tryptophan
- 4. Qualitative analysis of Tyrosine
- 5. Qualitative analysis of Histidine

REFERENCES

1. J. Jayaraman,Laboratory Manual in Biochemistry New Age International Pvt Ltd Publishers

2011

- 2. S. K. SawhneyRandhir Singh Introductory Practical Biochemistry Alpha Science International, Ltd,2 edition, 2005.
- 3. Irwin H.Saegal Biochemical calculations Liss, Newyork 1991

5. MATHEMATICS - II

Objectives of the Course

To Explore the Fundamental Concepts of Mathematics

UNIT-I: Application of Integration

Evaluation of double, triple integrals - Simple applications to area, volume - Fourier series for functions in $(0,2\pi)$ and $(-\pi,\pi)$.

UNIT-II: Partial Differential Equations

Formation, complete integrals and general integrals - Four standard types, Lagrange's equations.

UNIT-III: Laplace Transforms

Laplace Transformations of standard functions and simple properties - Inverse Laplace transforms - Applications to solutions of linear differential equations of order 1 and 2-simple problems

UNIT-IV: Vector Analysis

Scalar point functions - Vector point functions - Gradient, divergence, curl - Directional derivatives - Unit to normal to a surface.

UNIT-V: Vector Analysis (continued)

Line and surface integrals - Guass, Stoke's and Green's theorems (without proofs) - Simple problem based on these Theorems.

Recommended Text

P.Duraipandian and S.Udayabaskaran,(1997) Allied Mathematics, Vol. I & II.Muhil Publishers, Chennai

Reference Books:

- 1. P.Balasubramanian and K.G.Subramanian,(1997)*Ancillary Mathematics*. Vol. I & II. Tata McGraw Hill, New Delhi.
- 2. S.P.Rajagopalan and R.Sattanathan,(2005) *Allied Mathematics* .Vol. I & II.Vikas Publications, New Delhi.
- 3. P.R.Vittal(2003). Allied Mathematics .Marghan Publications, Chennai.
- 4. P.Kandasamy, K.Thilagavathy (2003) Allied Mathematics Vol-I, II S.Chand& company Ltd., New Delhi-55.
- 5. Isaac, Allied Mathematics. New Gamma Publishing House, Palayamkottai

ANNAMALAI UNIVERSITY MASTER OF SCIENCE M.Sc. CHEMISTRY DEGREE COURSE UNDER CBCS 2021-2022

The Course of Study and the Scheme of Examinations

S. No.	o. Study Components		Ins.	Credit	Title of the Paper	Ma	ximum I	Marks
			Hrs/ week					
	Course	Title						
1 ST YEAR- SEMESTTER I				CIA	Uni. Exam	Total		
1	MAIN	Paper-1	4	4	Organic Chemistry- I	25	75	100
2	MAIN	Paper-2	4	3	Inorganic Chemistry- I	25	75	100
3	MAIN	Paper-3	4	3	Physical Chemistry- I	25	75	100
4	MAIN PRACTICAL	Paper-1	4	0	Organic Chemistry Practical- I	-	-	-
5	MAIN PRACTICAL	Paper-2	4	0	Inorganic Chemistry Practical- I	-	-	-
6	MAIN PRACTICAL	Paper-3	4	0	Physical Chemistry Practical- I	-	-	-
7	ELECTIVE	Paper-1	3	3	(to choose 1 out of 3) A. Advanced Polymer Chemistry B. Heterocyclic Chemistry C. Materials Chemistry	25	75	100
8	OPEN ELECTIVE (Non-Major)	Paper-I	3	3	(to choose 1 out of 3) A.Chemistry in Agriculture B. Food Chemistry C. Industrial chemistry-I	25	75	100
			30	16		125	375	500

1 st YEAR- SEMESTER II					CIA	Uni. Exam	Total	
9	MAIN	Paper-4	3	3	Organic Chemistry- II	25	75	100
10	MAIN	Paper-5	3	4	Inorganic Chemistry- II	25	75	100
11	MAIN	Paper-6	3	3	Physical Chemistry- II	25	75	100
12	MAIN PRACTICAL	Paper-1	5	3	Organic Chemistry Practical- I	25	75	100
13	MAIN PRACTICAL	Paper-2	5	3	Inorganic Chemistry Practical- I	25	75	100
14	MAIN PRACTICAL	Paper-3	5	3	Physical Chemistry Practical- I	25	75	100

15	Compulsory pape	er	2	2	Human Rights	25	75	100
16	ELECTIVE	Paper-2	2	3	(to choose 1 out of 3)A. Green ChemistryB. Supramolecular and NanochemistryC. Modern Separation Techniques	25	75	100
17	OPEN ELECTIVE (Non-Major)	Paper-II	2	3	(to choose 1 out of 3)A. Medicinal ChemistryB. Textile chemistryC. Diary Chemistry	25	75	100
18	Field Study		-	2				100
			30	29				1000

* Field Study

There will be field study which is compulsory in the first semester of all PG courses with 2 credits. This field study should be related to the subject concerned with social impact. Field and Topic should be registered by the students in the first semester of their study along with the name of a mentor before the end of the month of August. The report with problem identification and proposed solution should be written in not less than 25 pages in a standard format and it should be submitted at the end of second semester. The period for undergoing the field study is 30 hours beyond the instructional hours of the respective programme. Students shall consult their mentors within campus and experts outside the campus for selecting the field and topic of the field study. The following members may be nominated for confirming the topic and evaluating the field study report.

(i). Head of the respective department

(ii). Mentor

(iii). One faculty from other department

SYLLABUS UNDER CBCS (2021-2022)

FIRST YEAR

SEMESTER I PAPER - 1 ORGANIC CHEMISTRY – I

OBJECTIVES:

To make the students learn and understand the concept of stereochemistry, conformational analysis and their application in the determination of reaction mechanism. To understand the mechanism of nucleophilic and electrophilic substitution reactions. To learn the importance of kinetics in organic reactions.

OUTCOMES:

The student will be able to

- Describe the concept of Stereochemistry
- Illustrate the importance of Conformation
- Analyze the mechanism of Aliphatic and Aromatic Substitution reactions
- Acquire knowledge on the various concepts of reaction kinetics and mechanism

UNIT-I: STEREOCHEMISTRY

Optical activity and chirality, classification of chiral molecules as asymmetric and dissymmetric. Topicity – Homotopic, enantiotopic and diastereotopic ligands and faces. A brief study of dissymmetry of allenes, biphenyls, spiro compounds, trans-cyclooctene and molecules with helical structures. Absolute configuration - R, S notation of biphenyls and allenes. Fischer projection. Inter conversion of Sawhorse, Newman and Fischer projections. Erythro and threo nomenclature, E and Z nomenclature - Asymmetric synthesis - Cram's rule. Stereospecific and stereoselective reactions.

UNIT-II: CONFORMATIONAL ANALYSIS

Conformational analysis of disubstituted cyclohexane and their stereochemical features (geometrical and optical isomerism (if shown) by these derivatives). Conformation and reactivity of substituted cyclohexanol (oxidation and acylation), cyclohexanone (reduction) and

cyclohexane carboxylic acid derivatives (esterification and hydrolysis). Conformation and stereochemistry of cis and trans-decalin and 9 - methyldecalin.

UNIT-III: ALIPHATIC SUBSTITUTION REACTIONS

Nucleophilic substitution reactions: SN1, SN2 and SNi mechanisms - Neighbouring group participation – Reactivity - structural and solvent effects - substitution in norbornyl and bridgehead systems - substitution at allylic and vinylic carbons - substitution by ambident nucleophiles - substitution at carbon doubly bonded to oxygen and nitrogen - alkylation and acylation of amines, halogen exchange, Von-Braun reaction, alkylation and acylation of active methylene carbon compounds, hydrolysis of esters, Claisen and Dieckmann condensation.

Electrophilic substitution reactions: SE1, SE2 and SEi mechanism, double bond shift - Reactivity. Migration of double bond, keto-enol interconversion, Stork- Enamine reaction, halogenation of aldehydes and ketones and decarboxylation of aliphatic acids.

UNIT-IV: AROMATIC SUBSTITUTION REACTIONS

Electrophilic substitution reactions: The arenium ion mechanism. Orientation and reactivity (ortho, meta and para directing groups). Typical reactions including Reimer - Tiemann reaction, Vilsmeyer - Hack, Gattermann, Gattermann - Koch reaction and Kolbe reaction. Synthesis of di and tri substituted benzene (symmetrical tribromo benzene, 2-amino-5-methyl phenol, 3-nitro-4-bromobenzoic acid, 3, 4- dibromonitrobenzene and 1, 2, 3 - trimethylbenzene) starting from benzene or any monosubstituted benzene.

Nucleophilic substitution reactions: Mechanisms: SNAr and Benzyne mechanisms. Methods for the generation of benzyne intermediate and reactions of aryne intermediate. Nucleophilic substitution involving diazonium ions. Aromatic nucleophilic substitution of activated halides, Ziegler alkylation and Chichibabin reaction.

UNIT – V QUANTITATIVE TREATMENT OF ORGANIC REACTIONS

Kinetic and Non-kinetic methods of determining reaction mechanisms. Isotope effects. Effect of structure on reactivity: Hammett and Taft equation. Partial rate factor. Significance of \Box and $\Box \Box \Box$ Simple problems

Recommended Books

1. Jerry March, Advanced organic chemistry, 4th edition, John wiley and sons, New York, 1992.

2. S. H. Pine, Organic chemistry, 5th edition, Mcgraw Hill international edition chemistry series, New York, 1987.

- 3. Seyhan. N. Ege, Organic chemistry, structure and reactivity, 3rd edition, A.I.T.B.S., New Delhi,1998.
- 4. P. S. Kalsi, Stereochemistry, Conformation analysis and Mechanism, II Edition, Wiley Eastern Limited, Chennai (1993).
- 5. Ernest Eliel, Stereochemistry of carbon compounds, McGraw Hill, New York (1962).

6. Francis A. Carey and Richard J. Sundberg, Advanced Organic Chemistry, Part A and B, III Edition, Plenum Press (1990).

7. B. Y. Paula Yurkanis Bruise, Organic Chemistry, 3rd edition, Pearson education, New Delhi 2002.

- 8. J. Miller, Advanced Organic Chemistry, III Edition.
- 9. J. Miller, Aromatic Nucleophilic Substitution
- 10. Nasipuri, Stereochemistry, Alhed Publishers, 2003.
- 11. Mc Murry, Organic Chemistry, V Edition, Asian Books Pvt Ltd (2000).
- 12. Michael Smith, Organic Synthesis, McGraw Hill, 1996.
- 13. Clayden, Greeves, Warren, Wothers, Organic Chemistry, Oxford Univ Press.
- 14. Neil Isaacs, Physical Organic Chemistry, ELBS Publications (1987).
- 15. P. Ramesh, Basic principles of Organic Stereochemistry, Madurai Kamaraj University.

16. P. S. Kalsi, Stereochemistry and mechanism through solved problems, WileyEastern Ltd., (1994).

17. R. K. Bansal, Organic Reaction Mechanism.

18. R.O.C. Norman, J.M. Coxon, Principle of Organic Synthesis, ELBS Publications, 1994.

19. S. M. Mukherji and S.P. Singh, Organic Reaction Mechanism, MacMillan India Ltd., Chennai (1990).

20. T. L. Gilchrist and C.W. Rees, Carbenes, Nitrenes and Arynes, Thomas Nelson and Sons Ltd., London.

21. Peter Sykes, A Guide book to mechanism in organic chemistry, Pearson Edition (2006).

22. C. N. Pillai, Textbook of Organic Chemistry, University press (India) private Ltd (2009).

PAPER -2 INORGANIC CHEMISTRY I

OBJECTIVES:

To learn about the inorganic polymers. To study the concept of coordination chemistry, stability of the complexes and stereochemistry of complexes. To know about the structure and bonding of inorganic compounds.

Outcomes:

The student will be able to

- *Explain Isopolyacids and hetropolyacids of Vanadium, Chromium, Molybdenum and Tungsten.*
- Descirbe the structure, properties, correlation and applications of some Inorganic polymers.
- Illustrates the chemistry of metal clusters.
- Discuss polyhedral boranes, carboranes and metallocarboranes.
- Explain the stability constant of co-ordination complexes.
- *Apply the stereo chemistry for co-ordination complexes.*
- Gain knowledge about the structure and bonding of Inorganic compounds.

UNIT-I: STRUCTURE AND BONDING - I

Polyacids: Isopolyacids and heteropolyacids of vanadium, chromium, molybdenum and tungsten.

Inorganic Polymers: Silicates, structure - properties - correlation and applications - molecular sieves, polysulphur - nitrogen compounds and poly – organophosphazenes

UNIT-II: STRUCTURE AND BONDING - II

Boron hydrides: Polyhedral boranes, hydroboration, carboranes and metallocarboranes. Metal clusters : Chemistry of low molecularity metal clusters (upto) trinuclear metal clusters, multiple metal-metal bonds. Cubane clusters and Zintl clusters.

UNIT-III: COORDINATION CHEMISTRY - I

Stability of complexes; thermodynamic aspects of complex formation; factors affecting stability, HSAB approach. Determination of stability constants by spectrophotometric, polarographic and potentiomteric methods.

UNIT-IV: COORDINATION CHEMISTRY - II

Stereochemical aspects; stereoisomerism in inorganic complexes; isomerism arising out of ligand distribution and ligand conformation; chirality and nomenclature of chiral complexes; optical rotatory dispersion and circular dichroism. Macrocyclic ligands; types; porphyrins; corrins, Schiff bases; crown ethers and cryptates.

UNIT-V: COORDINATION CHEMISTRY - III

Evidences for metal-ligand orbital overlap, molecular orbital theory and energy level diagrams, concept of weak and strong field ligands, Jahn-Teller distortion, charge - transfer spectra. Term states for "d"- ions, energy diagrams, d-d transitions, Orgel and Tanabe - Sugano diagrams, spin orbit coupling, nephelauxetic effect, spectral and magnetic characteristics of transition metal complexes.

TEXT BOOKS

1. F. A. Cotton and G.W. Wilkinson, Advanced Inorganic Chemistry– A comprehensive Text, John Wiley and Sons (1988).

2. J. E. Huheey, Inorganic Chemistry, Harper and Collins, NY, IV Edition, (1993).

3. K. F. Purcell and J. C. Kotz, Inorganic Chemistry WB Saunders Co., USA, (1977).

4. M. C. Shrivers, P.W Atkins, CH. Langford, Inorganic Chemistry, OUP, (1990).

5. N. N. Greenwood and Earnshaw, Chemistry of the Elements, Pergamon Press, New York (1984).

6. N. H Ray, Inorganic Polymers, Academic Press, (1978)

7. S. F. A. Kettle, Coordination Chemistry, ELBS, (1973).

Suggested References

8. A. B. P. Lever, Inorganic Electronic Spectroscopy, II Edn., Elsevier, New York, (1984).

9. B.E. Dogulas DH McDaniel's and Alexander, Concepts and Models of Inorganic Chemistry, Oxford IBH, (1983).

10. B.N. Figgis, Introduction to Ligand Fields, Interscience, (1966).

11. E.L. Mutterties, Polyhedral Boranes, Academic Press, New York (1975).

12. M.C. Day and J. Selbin, Theoretical Inorganic Chemistry, Van Nostrand Co., NY (1974).

13. W.U. Mallik, G.D. Tuli, R.D. Madan, Selected topics in Inorganic Chemistry, S. Chand and Co., New Delhi, (1992).

14. D. M.P.Mingos and D. J. Wales, Introduction to Cluster Chemistry, Prentice Hall, 1990.

15. R. Gopalan, Text book of Inorganic Chemistry, University press (India) private Ltd.

M. Sc. Chemistry: Syllabus (CBCS)

PAPER-3 PHYSICAL CHEMISTRY I

OBJECTIVE:

To study the partial molar property, fugacity and its significance. Theories and basic concepts of chemical kinetics - mechanism of acid, base and enzyme catalysis reaction. To acquire knowledge on phase equilibria of three component system. To study the basics of colloids.

OUTCOMES :

The student will be able to

- Explain partial molar properties and the concept of fugacity.
- Describe the phase diagrams of three component systems involving solid-liquid and liquid-liquid equilibria.
- Gain the knowledge about micelles, surfactants, structure and stability of colloids.

Illustrate the effect of pressure, dielectric constant and ionic strength of the solution on the rate of the reaction.

• Describe acid base and enzyme catalysis.

UNIT-I: THERMODYNAMICS

Partial molar properties -Partial molar free energy (chemical potential), Partial molar volume and Partial molar heat content - Their significance and determination of these quantities. Variation of chemical potential with temperature and pressure.

Definition of fugacity - determination of fugacity by graphical method - variation of fugacity with temperature and pressure - the concept of activity and activity coefficients – determination of activity and activity coefficient by emf method - determination of activity and activity coefficients for non-electrolytes - determination of standard free energies - choice of standard states.

UNIT-II: PHASE EQUILIBRIA

Physical equilibria involving phase transition: Two component system - Congruent system (phenol-aniline) and Incongruent system (sodium chloride- water) - Peritectic reactions. Three component system: Solid - Liquid equilibria - hydrate formation (sodium chloride - sodium sulphate - water); Liquid - Liquid equilibria - one pair of partially miscible liquids (acetic acid - chloroform - water and alcohol - benzene - water); two pairs of partially miscible liquids (water - ethyl alcohol - succinic nitrile).

UNIT-III: COLLOIDS

Surface phenomena - surfactants, micellization, critical micelle concentration (CMC), factors affecting CMC of surfactants, micro emulsions, reverse micelles and surface films (electro kinetic phenomena).

Structure and stability of colloids - Zeta potential (derivation), electro osmosis, protective colloids, gold number, sedimentation potential, streaming potential and Donnan membrane equilibrium.

UNIT-IV: CHEMICAL KINETICS

Absolute Reaction Rate Theory (ARRT) - Potential energy surfaces - partition function and activated complex- Eyring equation - estimation of free energy, enthalpy and entropy of activation and their significance.

Reactions in solutions - effect of pressure, dielectric constant and ionic strength on reactions in solutions - kinetic isotope effects - linear free energy relationships. Hammett and Taft equation.

UNIT-V: CATALYSIS

Acid - Base catalysis - mechanism of acid - base catalyzed reactions - Bronsted catalysis law. Catalysis by enzymes - Kinetics of enzyme catalyzed reaction - Michaelis - Menten equation and its interpretation. Effect of substrate concentration, pH and temperature on enzyme catalyzed reactions - inhibition of enzyme catalyzed reactions - Competitive, Non-competitive and Uncompetitive inhibition.

TEXT BOOKS

- 1. S. Glasstone, Thermodynamics for Chemists, Affiliated East West Press, New Delhi (1950).
- 2. J. Rajaram and J. C. Kuriacose, Thermodynamics for Students of Chemistry, Lal Nagin Chand, New Delhi (1986).
- Samuel Glasstone, Textbook of Physical Chemistry, Macmillan India Limited, 2nd Edition
- 4. Terence Cosgrove Colloid Science Principles, methods and applications
- 5. Robert J. Hunter Foundations of Colloid Science, 2nd Edition
- 6. J. Rajaram and J.C. Kuriacose, Kinetics and Mechanism of Chemical Transformations. Mac Millan India Ltd (1993).
- 7. K. J. Laidler, Chemical Kinetics, Harper and Row, New York (1987).

Suggested References

- 1. W. J. Moore, Physical Chemistry, Orient Longman, London (1972).
- 2. K. G. Denbiegh, Thermodynamics of Steady State, Methien and Co. Ltd, London (1951).
- 3. K. Nash, Elements of Chemical Thermodynamics, Addision Wesley (1962).
- 4. Alexander and Johnson- "Colloid science"- Oxford University Press
- 5. R. G. Frost and Pearson, Kinetics and Mechanism, Wisely, New York (1961).
- 6. Amdur and G. G. Hammes, Chemical Kinetics, Principles and Selected Topics, McGraw Hill, New York (1968).
- 7. M.V. Sangaranarayanan and V. Mahadevan, Text book of Physical Chemistry, University press (2011).

ELECTIVE PAPER-I (To choose 1 out of 3)

A. ADVANCED POLYMER CHEMISTRY

OBJECTIVE:

To gain the knowledge in the preparation, properties, characterization and applications of polymers.

OUTCOMES:

- *Have the knowledge on classification, nomenclature and properties of polymers.*
- Adequate knowledge on kinetics and mechanism of polymerisation.
- Understanding on characterization of polymers.
- Understand the morphology and applications of polymers.

UNIT-I: BASIC CONCEPTS

Classification - Nomenclature and isomerism - functionality - Molecular forces and chemical bonding in polymers - molecular weight – linear, branched and cross linked polymers. Thermoplastic and thermosetting polymers - Elastomers, fibers and resins. Techniques of polymerization - bulk solution, emulsion and suspension.

UNIT- II: KINETICS AND MECHANISM

Kinetics and mechanism of polymerization - free radical, cationic, anionic and coordination polymerization (Ziegler-Natta Catalyst). Copolymerization - kinetics (Detailed Study). General characterization-kinetic chain length-degree of polymerization, chain transfer - initiators - inhibitors - retarders.

UNIT-III: A. STRUCTURE AND PROPERTIES

Structure - property relationship - mechanical properties, thermal properties - glass transition temperature - factors affecting glass transition temperature - crystallinity and melting point - related to structure.

B. POLYMER CHARACTERIZATION AND ANALYSIS

Crystalline nature - X-Ray diffraction - Differential Scanning Calorimetry (DSC) - Thermo Gravimetric Analysis - molecular weight determination - Osmometry (membrane), viscosity, ultra centrifuge and gel permeation chromatography.

UNIT-IV: INDUSTRIAL AND NATURAL POLYMERS

Important industrial polymers - preparation and application of polyethylene, poly vinyl chloride, poly urethanes, polytetrafluro ethylene (TEFLON), nafion and ion - exchange resins. Importance of natural polymers - application and structures of starch, cellulose and chitosan derivatives.

UNIT-V: ADVANCES IN POLYMERS

Biopolymers - biodegradable polymers - biomedical polymers - poly electrolytes - conducting polymers - high temperature and fire retardant polymers - polymer blend - polymer composites - polymer nanocomposites - IPN inter penetrating network polymers - electroluminescent polymers.

TEXT BOOKS:

- 1. F. W. Bill Meyer. Text book of polymer science, III Edition, John Wiley and sons, New York.
- 2. P. J. Flory. Principles of Polymer Chemistry, Cornell Press (recent edition).
- 3. V. R. Gowarikar, B. Viswanathan, J. Sridhar, Polymer Science Wiley Eastern, 1986.
- 4. F. S. Misra Introduction to Polymer Chemistry, Wiley Eastern Ltd.,
- 5. P. Bahadur, N. V. Sastry, Principles of Polymer Science, Narosa Publishing House.
- 6. G. Odian, Principles of Polymerization, McGraw Hill Book Company, New York, 1973.
- 7. Charles E. Carraher, Jr, Seymour/Carraher's polymer chemistry. -- 7th Edition

Suggested References

1. Rudin, The Elements of Polymer Science and Engineering. Academic Press, New

York, 1973.

- 2. E. H. Brawn, The Chemistry of High Polymers, Butter worth & Co., London, 1948.
- 3. G. S. Krishenbaum, Polymer Science Study Guide, Gordon Breach Science publishing, New York, 1973.
- 4. E. A. Coolins, J. Bares and E. W. Billmeyer, Experiments in Polymer Science, Wiley Interscience, New York, 1973

M.Sc. Chemistry: Syllabus (CBCS)

PAPER-1

B. HETEROCYCLIC CHEMISTRY

OBJECTIVES:

To know the student about chemistry of heterocyclic compounds. To understands the strategies for designing the chemical synthesis. To make the students knowledgeable in higher heterocycles.

OUTCOMES:

- *Have the knowledge on nomenclature of heterocyclic compounds.*
- Understanding the molecular geometry of non-aromatic heterocycles.
- Gain knowledge on reaction mechanism of small ring heterocyclic compounds.
- Have knowledge on reaction mechanism of mesoionic and higher heterocyclic compounds.

UNIT I: NOMENCLATURE OF HETEROCYCLES

Introduction, nomenclature systems- systematic nomenclature system (Hantzsch – Widman system) and replacement nomenclature system for monocyclic, fused, spiro and bridged heterocycles. Aromatic heterocycles: Introduction, chemical behavior of aromatic heterocycles, classification (structural types). Criteria of aromaticity in heterocycles (bond lengths, dipole moments, empirical resonance energy, delocalization energy, Dewar resonance energy, chemical shits and ¹HNMR spectra).

UNIT- II: NONAROMATIC HETEROCYCLES

Introduction, strain, bond angle strain, torsional strain and their consequences in small ring heterocycles, conformations of six membered heterocycles – molecular geometry, barriers to ring inversion, pyramidal inversion and 1,3 diaxial interactions. Stereoelectronic effect in saturated six membered heterocycles- anomeric effect, other related effects and attractive interactions through space.

UNIT III: SMALL RING HETEROCYCLES

Three membered and four membered heterocycles: Synthesis and reactions of aziridines, oxiranes, thiranes, azetidines, oxetanes and thietanes. Benzo- fused five membered heterocycles: Synthesis and reactions including medicinal applications of benzopyrroles, benzofurans and benzothiophenes.

UNIT- IV: MESO IONIC HETEROCYCLES

General classification, chemistry of some important meso-ionic heterocycles of type A and B and their applications. Six membered heterocycles with on heteroatom: Synthesis and reactions of pyrylium salts and pyrones and their comparisons with pyridinium and thiopyrylium salts and pyridones.

UNIT- V: HIGHER HETEROCYCLES

Six membered heterocycles with two or more heteroatom: Synthesis and reactions of diazines. triazines and tetrazines. Seven and large membered heterocycles: Synthesis and reactions of azepines, oxepines, thiepines and diazepines. Synthesis of five and six membered heterocycles with P, As, Sb and Bi.

Text book:

1. Heterocyclic Chemistry, Vol. 1-3, R. R. Gupta, M. Kumar and V.Gupta, Spinger Verlag.

Suggested references:

- 2. The Chemistry of Heterocycles, T. Eicher and S. Hauptmann, Thieme.
- 3. Heterocyclic Chemistry, J. A. Joule, K. Mills and G. F. Smith, Chapman and Hall.

- 4. Heterocyclic Chemistry, T. L. Gilchrist, Longman Scientific Technical.
- 5. Contemporary Heterocyclic Chemistry, G. R. Newkome and W.W. Paudler, Wily –inter Science.
- 6. An Introduction to the Heterocyclic Compounds, R. M. Acheson, John wiely.
 - 7. Comprehensive Heterocyclic Chemistry, A. R. Katrizky and C.W. Rees, eds. Pergamon press.

PAPER-1 C. MATERIALS CHEMISTRY

OBJECTIVES:

To learn about different types of materials. To understand the classifications of materials. To learn the advancements of material chemistry.

OUTCOMES:

- Understanding on alloys, ceramics, composites and nano materials.
- Knowledge on liquid crystals, Ironic conductors, and pervoskites.
- Understanding on super conductors, NLO materials, second and third harmonic generation.
- Basic understanding on smart materials.

UNIT-I: MULTIPHASE MATERIALS

Ferrous alloys: Fe-C phase transformation in ferrous alloys, stainless steels, non-ferrous alloys, properties of ferrous and non-ferrous alloys and their applications.

Glasses: Glassy state, glass formers, glass modifiers and applications.

Ceramics: Ceramic structures, mechanical properties, clay products, refractoriescharacterizations, properties and applications.

Composites: Microscopic composites- dispersion-strengthened and particle reinforcesfibre-reinforced composites and macroscopic composite.

Nanomaterials: Nanocrystalling phase- preparation- special properties and applications.

Thin films and Langmuir - Blodgett films: Preparation techniques; evaporation/sputtering and sol-gel methods. Photolithography, properties and application of thin films.

UNIT-II: LIQUID CRYSTALS

Mesomorphic behaviour, thermotropic liquid crystals, positional order, bond orientational order, nematic and smectic mesophases; smectic-nematic transition and clearing temperature-horneotropic, planar and schlieren textures, twisted nematics, chiral nematics, molecular arrangement in smectic A and smectic C phases, optical properties of liquid crystals. Dielectric susceptibility and dielectric constants.

UNIT-III: IONIC CONDUCTORS

Types of ionic conductors, mechanism of ionic conduction, interstitial jumps (Frenkel). Vacancy mechanism, diffusion super ionic conductors; phase transitions and mechanism of conduction in super ionic conductors, examples and applications of ionic conductors.

High Tc Materials: Defect perovskites, high Tc superconductivity in cuprates, preparation and characterization of 1-2-3 and 2-1-4 materials, anisotropy, normal state properties: temperature dependence of electrical resistance, optical phonon modes, super conducting state; heat capacity;

Coherence length, elastic constants, position lifetimes and microwave absorption - Applications of high Tc materials.

UNIT-IV: MATERIALS FOR SOLID STATE DEVICES

Rectifiers, transistors, capacitors- IV-V compounds, low dimensional quantum structures, optical properties.

Organic solids: Conducting organic solids, organic superconductors and magnetism in organic materials.

Fullerenes: doped fullerenes as superconductors.

Molecular devices: Molecular rectifiers and transistors, artificial photosynthetic devices, optical storage memory and switches-sensors.

Nonlinear optical materials: nonlinear optical effects. Second and third order - molecular hyper polarisability and second order electric susceptibility - materials for second and third harmonic generation.

UNIT-V: ADVANCED MATERIALS

Brief study of the following: Fiber reinforced plastics (FRP), fiber reinforced metals (FRM), metal matrix composites (MMC), surface acoustic wave (SAW) materials, ceramics and cermets, electrets and SMART materials.

BOOKS SUGGESTED:

- 1. Solid State Chemistry and its applications, Anthony R.West, (1998), John Wiley & Sons, New York.
- 2. Material Science and Engineering. An Introduction. W.D. Callister. Wiley.
- 3. Principles of the Solid State, H.V. Keer. Wiley Eastern.
- 4. Materials Science for Engineers: J. C. Anderson, K.D. Leaver, P. Leevers and R.D. Rawlings, 5TH Edition, Nelson Thornes Ltd.
- 5. Thermotropic Liquid Crystals. Ed. G.W. Gray. John Wiley.
- 6. Handbook of Liquid Crystals. Kelker and Hafz. Chemie Verlag.
- 7. Materials science, M. Arumugam , Anuradha publications (2012) , Chennai.
- 8. Materials Science, S. L. Kakani, Amit Kakani, (2006), New Age International (P) Limited, Publishers, Chennai.
- **9.** Material Science and Engineering: A First Course, V. Raghavan, 5TH Edition (2007), Prentice-Hall of India (P) limited.
- 10. A.R. West, Solid State Chemistry and its Applications, (1984) John Wiley & Sons, Singapore.
- 11.C.N R. Rao and J. Gopalkrishnan, New Directions in Solid State Chemistry, (1997) Cambridge Univ. Press.
- 12. T. V. Ramakrishnan and C. N. R. Rao, Superconductivity Today, (1992) Wiley Eastern Ltd., New Delhi.
- 13.P. Ball, Designing the Molecular World: Chemistry at the Frontier, (1994) Princeton University Press.

OPEN ELECTIVE (NON MAJOR) PAPER-I (To choose 1 out of 3)

A. CHEMISTRY IN AGRICULTURE

OBJECTIVES:

- To make the students learn the different types of fertilizers.
- To understand the classification of manures.
- To understand the usage of pesticides.
- To learn the importance of fungicide and herbicide.
- To make the students aware of different soils.

OUTCOMES:

The student will be able to

- Differentiate between different types of fertilizers.
- Acquire knowledge on the various types of manures.
- Appreciate the usage of different pesticides with caution
- Illustrate the importance of types of herbicides and preservation of seeds
- Analyze the characteristics of different soils.

UNIT – I Fertilizers : Effect of Nitrogen, potassium and phosphorous on plant growth – commercial method of preparation of urea, triple superphosphate. Complex fertilizers and mixed fertilizers – their manufacture and composition. Secondary nutrients – micronutrients – their function in plants.

UNIT – II Manures : Bulky organic manures – Farm yard manure – handling and storage. Oil cakes. Blood meal – fish manures.

UNIT – III Pesticides and Insectides : Pesticides – classification of Insecticides, fungicides, herbicides as organic and inorganic – general methods of application and toxicity. Safety measures when using pesticides. Insecticides : Plant products – Nicotine, pyrethrin – Inorganic pesticides – borates. Organic pesticides – D.D.T. and BHC.

UNIT – IV Fungicides and Herbicides : Fungicide : Sulphur compounds, Copper compounds, Bordeaux mixture. Herbicides : Acaricides – Rodenticides. Attractants – Repellants. Preservation of seeds.

UNIT – V

SOILS -Classification and properties of soils –soil water, soil temperature, soil minerals, soil acidity and soil testing.

PAPER-I (To choose 1 out of 3)

B. FOOD CHEMISTRY

OBJECTIVE:

- To understand the different sources of food
- To learn the concept of food poisoning.
- To understand the techniques of food preservation.
- To study the importance of vitamins and uses.
- To appreciate the different minerals needed for day to day life

OUTCOMES:

The student will be able to

- Appreciate the importance of various foods.
- Acquire knowledge of remedies for various ailments.
- Identify the causes for food spoilage.
- Reason out the deficiency of vitamins.
- Illustrate the importance of minerals.

UNIT-I FOOD ADULTERATION Sources of foods, types, advantages and disadvantages, constituents of foods, carbohydrate, protein, fats and, oils, colours, flavours, natural toxicants.

UNIT-II FOOD POISONING Sources, causes and remedy- Causes and remedies for acidity, gastritis, indigestion and constipation

UNIT-III FOOD PRESERVATION AND PROCESSING Food spoilage, courses of food spoilage, types of Food spoilage, food preservation ,preservation and processing by heating-sterilisation, pasteurization.

UNIT-IV VITAMINS Sources, requirement deficiency diseases of A, C, K, E1 and B6

UNIT-V MINERALS Mineral elements in food-Principal mineral elements-source. Function-Deficiency and daily requirements-Na, K, Mg, Fe, S and P

REFERENCE BOOKS: 1.Seema Yadav : —Food Chemistry^{II}, Anmol publishing (P) Ltd, New Delhi

2.Car H. Synder : — The Extraordinary Chemistry for ordinary things || ,John Wiley & sons inc..,New York,1992.

3. Sivasankar – Food Processing and Preservation PHI.(Eastern Economy Editions)

PAPER-I (To choose 1 out of 3) C. INDUSTRIAL CHEMISTRY-I

OBJECTIVES:

To make the students learn about fertilizers To understand the importance of sugarIndustries To learn the importance of Chemical explosives To study about the leather industries To understand the importance of water industry **OUTCOMES:** The students will be able to Acquire knowledge of fertilizers Appreciate the importance of sugar industries in India Acquire knowledge of Chemical explosives Illustrate the importance of leather industries Identify the importance of water industry

UNIT I Fertilizers : Fertilizer industries in India, Manufacture of ammonia, ammonium salts, urea, superphosphate, triple superphosphate and nitrate salts.

UNIT II Sugar : Cane sugar manufacture, recovery of sugar from molasses, sugar estimation-sugar industries in India.

UNIT III Chemical Explosives : Preparation and chemistry of lead azide, nitroglycerine, nitrocellulose, TNT, RDX,Dynamite, cordite, picric acid, gunpowder, introduction to rocket propellants.

UNIT IV Leather Industry : Curing, preservation and tanning of hides and skins, process of dehairing and dyeing. Treatment of tannery effluents.

UNIT V Water Industry: Pollution of water by fertilizers, detergents, pesticides and industrial wastes, BOD,COD, thermal pollution. Water Treatment – Ion exchange, electrodialysis, reverse osmosis, softening of hard water. 121

Reference : 1. B.N.Chakrabarty, Industrial Chemistry, Oxford & IBH Publishing Co, New Delhi, 1981.

 B.K. Sharma, Industrial Chemistry, Goel Publishing House, Meerut.
P.P.Singh, T.M.Joesph, R.G.Dhavale, College Industrial Chemistry, Himalaya Publishing House, Bombay, 4th Ed., 1983 125

SEMESTER II

PAPER - 4

ORGANIC CHEMISTRY II

OBJECTIVES:

To understand the nature of carbon-hetero atom multiple bond additions and the mechanism of a chemical reactions. To appreciate the principles of addition and elimination reactions. To learn various synthetically important reactions with a view to appreciate their scope, limitations and use in synthetic sequences. To learn the chemistry of free radicals and their importance. To understand the concept of Aromaticity.

OUTCOMES:

The student will be able to

- Elucidate the mechanism of addition and elimination reactions
- Appreciate the synthetic usage of various oxidizing and reducing reagents
- Illustrate the importance of free radicals
- Describe the concept of aromaticity

UNIT-I: ADDITION TO CARBON - CARBON AND CARBON – HETERO MULTIPLE BONDS

Electrophilic, nucleophilic and neighbouring group participation mechanisms - addition of halogen and nitrosyl chloride to olefins. Hydration of olefins and acetylenes. Hydroboration, hydroxylation, Michael addition, 1, 3 - dipolar additions, Simon - Smith reaction. Mannich, Stobbe, Darzen, Wittig, Wittig - Horner and Benzoin reactions. Carbenes and nitrenes: Methods of generation, structure, addition reactions with alkenes and insertion reactions.

UNIT-II: ELIMINATION REACTIONS

E1, E2 and E1CB mechanism - E1, E2 and E1cB spectrum - Orientation of the double bond - Hofmann and Saytzeff rules - Competition between elimination and substitution. Typical elimination reactions- dehydration, dehydrohalogenation and dehalogenation. Stereochemistry of E2 eliminations in cyclohexane systems. Mechanism of pyrolytic eliminations. Chugaev and Cope eliminations.

UNIT-III: OXIDATION AND REDUCTION

Mechanism - study of the following oxidation reactions - oxidation of alcohols - use of DMSO in combination with DCC and acetic anhydride in oxidising alcohols - oxidation of methylene to carbonyl, oxidation of aryl methane - allylic oxidation of olefins - ozonolysis - oxidation of olefinic double bonds and unsaturated carbonyl compounds - oxidative cleavage of C-C bond. Reduction: Selectivity in reduction of 4-t-butylcyclohexanone using selecterides. Hydride reductions - reduction with LiAlH4, NaBH4, sodium cyanoborohydride, trialkyl tin hydride and hydrazines.

UNIT-IV: FREE RADICALS

Long and short-lived free radicals - methods of generation of free radicals - detection of free radicals by ESR - Addition of free radicals to olefinic double bonds - aromatic radical substitutions reactions - decomposition of diazo compounds – phenol coupling - Sandmeyer reaction - Gomberg reaction - Pschorr reaction - Ulmann reaction and Hunsdiecker reaction.

UNIT-V: AROMATICITY

Aromaticity of benzenoid - non-benzenoid, and heterocyclic compounds - Huckel's rule -Aromatic systems with π electron numbers other than six - non-aromatic (cyclo octatetraene etc.) and anti aromatic system (cyclobutadiene etc.) - system with more than 10π electrons - Annulenes upto C18 (synthesis of all these compounds is not expected).

Recommended Books

1. Francis A. Carey and Richard J, Sundberg, Advanced Organic Chemistry - Part B, 3rd Edition (1990).

2. H. O. House, Modern Synthetic Reactions, Benjamin Cummings Publishing Company, London (1972).

3. W. Carruthers, Iain Coldham, Modern Methods of organic synthesis, IV Edition.

4. W. Carruthers, Some Modern Methods of Organic Synthesis, III Edition, Cambridge , University Press, (1993).

5. J. March, Advanced organic reaction mechanism and structure, Tata McGraw Hill.

6. Mc Murry, Advanced organic chemistry, Thomas Pvt. Ltd.,

- 7. Michael B. Smith, Organic Synthesis, McGraw Hill, International Edition (1994).
- 8. L.F. Fieser and M. Fieser, Organic Chemistry, Asia Publishing House, Bombay, 2000.
- 9. Reinhard Brukner, Advanced Organic Chemistry, Academic Press, Elseiver, 2002.

10. C.K. Ingold, Structure and Mechanism in Organic Chemistry, Cornell Univ. Press .

11. Parmer and Chawla, Organic reaction mechanisms, S. Chand and Co.,

12. R. E. Ireland, Organic synthesis, Prentice Hall of India

13. R.O.C. Norman, Principles of organic synthesis, Chapman and Hall, London. 1980.

14. Raymond K. Mackie and David M. Smith, Guide book to Organic synthesis, ELBS Publication.

15. S. M. Mukherji and S.P. Singh, Organic Reaction Mechanism, MacMillan India Ltd., Chennai (1990).

16. C. N. Pillai, Textbook of Organic Chemistry, University press (India) private Ltd (2009).

17. R. T. Morrison and R. N. Boyd, Organic chemistry, 6th edition, Prentice Hall of India Limited., New Delhi, 1992

M.Sc. Chemistry: Syllabus (CBCS)

PAPER - 5

INORGANIC CHEMISTRY II

OBJECTIVES:

To make the students knowledgeable in solid state chemistry. To equip the students for their future career in nuclear industry. To learn the chemistry of lanthanides, to learn about nanotechnology and use of inorganic compounds in biological chemistry **OUTCOMES :**

- Explain about the structure and properties of solids.
- Describe the types of Nuclear reactions.
- Explain about the stellar energy.
- Discuss the types of Nuclear reactors.
- Illustrate the radio analytical methods
- Describe the chemistry of lanthanides and actinides.
- Applying Nanotechnology to various metals.
- Illustrate the types of transport proteins.

UNIT-I: THE CHEMISTRY OF SOLID STATE

Structure of solids; Comparison of X-ray and Neutron Diffraction; structure of pyrovoskite, cadmium iodide and nickel arsenide; spinels and antispinels, defects in solids, non-stoichometeric compounds. Electrical, magnetic and optical properties of solids, band theory. Semiconductors, superconductors, solid state electrolytes. Types of magnetic behaviour, dia, para, ferro, antiferro and ferrimagnetism, hysterisis. Solid state lasers, inorganic phosphors and ferrites.

UNIT- II: NUCLEAR CHEMISTRY-I

Nuclear properties: Nuclear spin and moments, origin of nuclear forces, Nuclear models: liquid drop model and nuclear shell model. Modes of radioactive decay: Orbital electron capture, nuclear isomerism, internal conversion. Detection and determination of activity by cloud chamber, nuclear emulsion, bubble chamber, Geiger-Muller, scintillation and Cherenkov counters.

Nuclear reactions: Types, cross section, compound nucleus theory, high energy nuclear, direct nuclear, photonuclear and thermonuclear reactions.

UNIT- III: NUCLEAR CHEMISTRY-II

Stellar energy: synthesis of elements, hydrogen burning, carbon burning. Nuclear reactors: fast breeder reactors, particle accelerators, linear accelerators, cyclotron and synchrotron. Radio analytical methods: Isotope dilution analysis, radiometric titrations, radio immuno assay. Neutron activation analysis.

UNIT-IV: THE CHEMISTRY OF LANTHANIDES, ACTINIDES AND NANOTECHNOLOGY

The chemistry of solid state, lanthanides and actinides, oxidation state, spectral, magnetic characteristics, coordination numbers, stereochemistry, nuclear and non-nuclear applications.

Nanotechnology: Introduction - preparatory methods, characterization, application as sensors, biomedical applications, application in optics and electronics.

UNIT-V: BIOINORGANIC CHEMISTRY

Transport proteins: Oxygen carriers, metalloenzymes, carboxy peptidase, carbonic anhydrase, redox process, iron-sulphur proteins, chlorophyll, salient features of the photo synthetic process, vitamin- B_{12} , role of sodium, potassium, calcium, zinc and copper; fixation of nitrogen, nitrogen cycle.

Text Books

1. A. R. West, Basic solid state chemistry, John Wiley, (1991).

2. S. Glasstone, Source Book on Atomic Energy, Van Nostrand Co., (1969).

3. G. Frielander, J. W. Kennedy and J. M. Miller, Nuclear and Radiochemistry, John Wiley and Sons (1981).

4. Hari Jeevan Arnikar, Essentials of nuclear chemistry, New Age International (P) Ltd., (2005).

5. Hari Jeevan Arnikar, Nuclear Chemistry Through Problems, New Age International (P) Ltd., (2007).

6. G. T. Seaborg, Transuranium elements, Dowden Hitchinson and Ross, (1978).

7. Nishit Mathur, Nanochemistry, RBSA publishers (2010).

8. Patric Salomon, A hand book on Nano Chemistry, Dominant publishers and distributors (2008).

9. G. B. Sergeev, Nanochemistry, Elsevier Science and Technology (2007).

10. U. Saityanarayana, Essentials of Biochemistry, Books and Allied (P) Ltd.,

11. T. Pradeep, Nano: The essentials., McGrew Hill Education.(2007)

Suggested References

- 11. W. E. Addison, Structural principle in inorganic chemistry, Longman (1961).
- 12. D. M. Adams, Inorganic solids, John Wiley Sons (1974).
- 13. Azaroff, Solid State Chemistry, John Wiley.
- 14. B. E. Dogulas DH McDaniel's and Alexander, Concepts and Models of Inorganic Chemistry, Oxford IBH, (1983)

15. M. C. Day and J. Selbin, Theoretical Inorganic Chemistry, Van Nostrand Co., New York (1974).

16. J.E. Huheey, Inorganic Chemistry - Principles, Structure and Reactivity, Harper Collins, New York, IV Edition (1993).

17. N. Greenwood and A. Earnshaw, Chemistry of Elements, Pergamon, NY, (1984). 18. F.A. Cotton and G. Wilkinson Advanced Inorganic Chemistry - A Comprehensive Text, John Wiley and Sons, V Edition (1988).

19. K.F. Purcell and J.C. Kotz, Inorganic Chemistry - WB Saunders Co., USA (1977) 20. W. U. Mallik, G.D. Tuli, R.D. Madan, Selected topics in Inorganic Chemistry, S. Chand and Co., New Delhi, (1992).

21. M.N. Hughes, The Inorganic Chemistry of Biological processes, Wiley London, II Edition (1982).

22. Jonathan W. Stead, David R. Turner and Karl. J. Wallace., Core concepts in Supramolecular Chemistry and Nanochemistry, John Wiley sons Ltd (2007).

23. Beoffry A.Ozin, Andre Arsenault, Ludovico & Cademartiri. Nano chemistry - A chemical approach to nano materials, Royal Society of chemistry (2009).

24. Kenneth J. Klabunde, Nano scale materials in Chemistry A. John Wiley & Sons Publishers (2001).

25. L. Stryer, Biochemistry, V Edition, Freeman & Co., New York (2002).

26. D. L. Nelson and M. M. Cox, Lehninger, Principles of Biochemistry, III edition, McMillan North Publication (2002).

27. W. Kaim and B. Schwederski, Bioinorganic Chemistry: Inorganic Elements in the Chemistry of Life, an Introduction and Guide, Wiley, New York (1995).

28. S. J. Lippard and J. M. Berg, Principles of Bioinorganic Chemistry, University Science Books (1994).

29. I. Bertini, H. B. Grey, S. J. Lippard and J. S. Valentine, Bioinorganic Chemistry, Viva Books Pvt. Ltd., New Delhi (1998).

30. R. Gopalan, Text book of Inorganic Chemistry, University press (India) private Ltd.

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PAPER-6 PHYSICAL CHEMISTRY II

OBJECTIVES:

To understand the behavior of kinetic reactions and fast reaction. To understand the behavior of electrolytes in solution. To know the structure of the electrode surface. To differentiate electrode kinetics from other types of kinetic studies. To know the applications of electrode process. To study the concept and applications of group theory.

OUTCOMES:

- Describe the rate expression for complex reactions and experimental study of fast reactions.
- Describe Debeye-Huckel limiting law and Bronsted equation.
- Explain the structures of double layer and deriving Lippmann equation.
- Apply group theory and finding the symmetries and point group to construct character tables of C2V and C3V.

UNIT-I: KINETICS OF COMPLEX REACTIONS & FAST REACTIONS

Kinetics of complex reactions, reversible reactions, consecutive reactions, parallel reactions, chain reactions, general treatment of chain reactions - chain length - Rice Herzfeld mechanism - explosion limits.

Study of fast reactions - relaxation methods - temperature and pressure jump methodsstopped flow and flash photolysis methods.

UNIT-II: ELECTROCHEMISTRY – I

Mean ionic activity and mean ionic activity coefficient - activity coefficient of strong electrolytes - determination of activity coefficient by electrochemical method.

Debye Huckel limiting law - qualitative and quantitative verification - limitation - Debye Huckel limiting law at appreciable concentrations of electrolytes - Debye - Huckel - Bronsted equation.

UNIT-III: ELECTROCHEMISTRY – II

Electrode - electrolyte interface - adsorption at electrified interface - electrical double layer - electro capillary phenomenon - Lippmann equation - Structure of double layers -Helmholtz - Perrin, Guoy - Chapman and Stern model of electrical double layers. Diffusion - Fick's law of diffusion - Effect of ionic association on conductance-electro kinetic phenomena -membrane potential.

UNIT-IV: GROUP THEORY – I

Definition of basic terms in group theory – Group – Abelian group, cyclic group, subgroup, group multiplication table - similarity transformation and class, symmetry elements and symmetry operations -Point groups (any examples limited to n = 4 of C_{nv} , C_{nh} , D_{nh} , D_{nd} , & T, T_d, O, O_h), Reducible and Irreducible representations - direct product representation. Character Table - explanation of various column and Mullliken Symbol.

UNIT-V: GROUP THEORY – II

Orthogonality theorem and its consequences - construction of character table for C_{2V} , C_{3V} , C_{2h} , and D_{2d} point groups - hybrid orbitals in nonlinear molecules (CH₄, BF₃, and NH₃). Determination of representations of vibrational modes in nonlinear molecules

 $(H_2O, NH_3, BF_3 and [PtCl_4]^2$). Symmetry selection rules of Infra-red and Raman spectra.

TEXT BOOKS

- 1. J. Rajaram and J. C. Kuriacose, Kinetics and Mechanism of Chemical Transformations. Mac Millan India Ltd (1993).
- 2. K. J. Laidler, Chemical Kinetics, Harper and Row, New York (1987).
- 3. K. L. Kapoor, A text book of Physical Chemistry, Mac Millan India Ltd., (2001).
- 4. S. Glasstone, Introduction to Electrochemistry, Affiliated East West Press, New Delhi (1960).
- 5. D. R. Crow, Principles and Applications to Electrochemistry, Chapman and Hall (1991).
- 6. K.V. Raman, Group Theory and its Applications to Chemistry, Tata Mc Graw Hill Publishing Co., (1990).
- 7. P. K. Bhattacharya, Group Theory and its Applications, Himalaya Publishers.
- 8. K.V. Ramakrishnan and M. S. Gopinath, Group Theory in Chemistry, Vishal Publications (1998).

SUGGESTED REFERENCES

- 1. R. G. Frost and Pearson, Kinetics and Mechanism, Wisely, New York (1961).
- 2. C. Capellos and B. H.J. Bielski, Kinetic Systems, Wisely Interscience, New York (1972).
- 3. Amdur and G.G. Hammes, Chemical Kinetics, Principles and Selected Topics, McGraw Hill, New York (1968).
- 4. G. M. Harris, Chemical Kinetics, D. C. Health and Co., (1966).
- 5. J. Robbins, Ions in Solution An Introduction of Electrochemistry, Clarendon Press, Oxford (1972).
- 6. John O. M. Bockris, Amulya K.N. Reddy, Modern Electrochemistry 2B: Electrodics in Chemistry, Engineering, Biology and Environmental Science
- F. A. Cotton, Chemical Applications of Group Theory, John Wiley and Sons inc., New York (1971).
- 8. N. Thinkham, Group Theory and Quantum Mechanics, McGraw Hill Book Company, New York (1964).
- 9. S. Schonland, Molecular Symmetry, Vannostrand, London (1965).
- 10. Alan Vincent, Molecular Symmetry and Group Theory-Programme Introduction to Chemical Application, Wiley, New York (1977).

11. S. Swarnalakshmi, T. Saroja and R. M. Ezhilarasi, A simple Approach to Group Theory in Chemistry, University press (India) private Ltd (2008).

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MAIN PRACTICAL PAPER – 1 ORGANIC CHEMISTRY PRACTICAL- I

- A) Identification of components in a two component mixture and preparation of their derivatives. Determination of b.p. / m.p. for components and m.p. for the derivatives.
- B) Any Six preparations from the following:
 - 1. Preparation of o-benzoyl benzoic acid (Fridel Crafts Reaction)
 - 2. p-Nitrobenzoic acid from p-nitrotoluene (Oxidation)
 - 3. Anthroquinone from anthracene (Oxidation)
 - 4. Glucose pentaacetate from Glucose (Acetylation)

- 5. m-Nitroaniline from m-dinitrobenzene (Reduction)
- 6. Benzophenone oxime from benzophenone (Addition reaction)
- 7. p-Chlorotoluene from p-toluidine (Sandmeyers' Reaction)
- 8. 2,3 Dimethylindole from phenyl hydrazine and 2 butanone (Fisher Indole Synthesis)
- 9. 1,2,3,4 Tetrahydrocarbazole from cyclohexanone (Fisher Indole Synthesis)
- 10. Methyl orange from sulphanilic acid (Diazo Reaction)

University	Marks
Examination	
Qualitative organic	40
Analysis	
Preparation	20
Viva voce	10
Record	05
Total	75

<u>CONTINUOUS INTERNAL ASSESSMENT MARKS (CIA MARK)</u> <u>MAX. MARKS = 25</u>

Evaluation method for practical paper:

Distribution of Marks

Internal assessment	Marks
Two Tests	10
Results accuracy	10
Attendance/ Regularity	5
Total	25

References:

- 1. Arthur I. Vogel, "A Textbook of Practical Organic Chemistry", ELBS.
- 2. N.S. Gnanapragasam and B. Ramamoorthy, "Organic Chemistry Lab Manual" (2006), S. Visvanathan Printers & Publishers.

PRACTICAL PAPER – 2 INORGANIC CHEMISTRY PRACTICAL – I

- A) Semimicro qualitative analysis of mixture containing two common and two rare cations. The following are the rare cations to be included. W, Ti, Te, Se, Ce, Th, Zr, V, U, Li, Mo and Be.
- **B)** Complexometric Titrations (EDTA): Estimation of Ca, Mg and Zn.

C) Preparation of the followings:

- 1. Potassium tris (oxalate) aluminate (III) trihydrate
- 2. Tris (thiourea) copper (I) chloride
- 3. Potassium tris (oxalato) chromate (III) trihydrate
- 4. Sodium bis(thiosulphato) cuprate (I)
- 5. Tris (thiourea) copper (I) sulphate
- 6. Sodium hexanitrocobaltate (III)
- 7. Chloropentammine cobalt (III) chloride
- 8. Bis (acetylacetonato) copper (II)
- 9. Hexamminenickel (II) chloride
- 10. Bis (thiocyanato) pyridine manganese (II)

D). Separation of zinc and magnesium on an anion exchange.

Marks distribution:

University Examination	Marks
Qualitative Inorganic Analysis	25
EDTA Complexometric Titration	20
Preparation	15
Viva Voce	10
Record	05
Total	75

M. Sc. Chemistry: Syllabus (CBCS)

<u>CONTINUOUS INTERNAL ASSESSMENT MARKS (CIA MARK)</u> <u>MAX. MARKS = 25</u>

Evaluation method for practical paper:

Distribution of Marks

Internal assessment	Marks
Two Tests	10
Results accuracy	10
Attendance/ Regularity	5
Total	25
PRACTICAL PAPER-3 PHYSICAL CHEMISTRY PRACTICAL- I

Experiments in Thermodynamics, colligative properties, phase rule, chemical equilibrium and chemical kinetics.

Typical examples are given and a list of experiments is also provided from which suitable experiments can be selected as convenient.

- 1. Heat of solution from Solubility measurements
- 2. Determination of Molecular weight
- 3. Determination of activity and activity coefficient
- 4. Construction of Phase diagram involving two / three component systems
- 5. Determination of partial molar quantities
- 6. Verification of Freundlich Adsorption isotherm
- 7. Reaction rate and evaluation of other kinetic parameters using polarimetry
- 8. Determination of Reaction rate and Rate constant using Analytical techniques: Conductometry and Dilatometry
- 9. Verification of Beer Lambert law.

Detailed list of Experiments for Physical Chemistry Practical I

Typical list of possible experiments is given.

Experiments of similar nature and other experiments may also be given.

Any 15 experiments have to be performed in a year.

- 1. Determine the temperature coefficient and energy activation of hydrolysis of ethyl acetate.
- 2. Study the kinetics of the reaction between acetone and iodine in acidic medium by half-life method and determine the order with respect to iodine and acetone.
- 3. Study the effect of solvent (DSMO-water, acetone-water system) on the rate of acid catalysed hydrolysis of acetal by dilatometry.
- 4. Study the Saponification of ethyl acetate by sodium hydroxide conductometrically and determine the order of the reaction.
- 5. Determine the order with respect to Silver (I) in the oxidation and rate constant and for uncatalysed reaction.
- 6. Study the inversion of cane sugar in the presence of acid using Polarimeter.
- 7. Determine the rate constant and order of the reaction between potassium persulphate and potassium iodide and determine the temperature coefficient and energy of activation of the reaction.
- 8. Study the effect of ionic strength on the rate constant for the saponification of an

ester.

- 9. Study the salt effect on the reaction between acetone and iodine.
- 10. Study the kinetics of the decomposition of sodium thiosulphate by mineral acid (0.5M HCI).
- 11. Study the primary salt effect on the kinetics of ionic reactions and test the Bronsted relationship (iodide ion is oxidized by persulphate ion).
- 12. Study the kinetics of enzyme catalysed reactions (Activity of tyrosinase upon tyrosine spectrophotometrically).
- 13. Study the salt effect, the solvent effect on the rate law of alkaline hydrolysis of crystal violet.
- 14. Study the reduction of aqueous solution of ferric chloride by stannous chloride.
- 15. Determine the molecular weight of benzoic acid in benzene and find the degree of association.
- 16. Determine the activity coefficient of an electrolyte by freeing point depression method.
- 17. Study the phase diagram form-toluidine and glycerine system.
- 18. Construct the phase diagram for a simple binary system naphthalene phenantherene and benzophenone-diphenyl amine.
- 19. Construct the boiling point composition diagram for a mixture having maximum boiling point and minimum boiling point.
- 20. Study the complex formation between copper sulphate and ammonia solution by partition method.
- 21. Study the simultaneous equilibria in benzoic acid benzene water system.
- 22. Determine the degree of hydrolysis and hydrolysis constant of aniline hydrochloride by partition method.
- 23. Determine the molecular weight of a polymer by viscosity method.
- 24. Determine the viscosities of mixtures of different compositions of liquids and find the composition of a given mixture.
- 25. Determine the partial molal volume of glycine / methanol and formic acid / sulphuric acid by graphical method and by determining the densities of the solutions of different compositions.
- 26. Study the temperature dependence of the solubility of a compound in two solvents having similar inter molecular interactions (benzoic acid in water and in DMSO water mixture) and calculate the partial molar heat of solution
- 27. Construct the phase diagram of the three component of partially immiscible liquid system (DMSO-water benzene; acetone-chloroform -water; chloroform-acetic acid-water)
- 28. Construct the phase diagram of a ternary aqueous system of glucose -potassium chloride and water
- 29. Study the surface tension concentration relationship for solutions (Gibb's equation)
- 30. Study the absorption of acetic acid by charcoal (Freundlich isotherm).
- 31. Study the complex formation and find the formula of silver-ammonia complex by

distribution method.

32. Determine the dissociation constant of picric acid using distribution law

Marks distribution:

University examination	Marks			
Procedure	10			
Manipulation	25			
Result	25			
Viva voce	10			
Record	05			
Total	75			

<u>CONTINUOUS INTERNAL ASSESSMENT MARKS (CIA MARK): MAX.</u> <u>MARKS = 25</u>

Evaluation method for practical paper:

Distribution of Marks

Internal assessment	Marks			
Two Tests	10			
Results accuracy	10			
Attendance/ Regularity	5			
Total	25			

ELECTIVE PAPER-2 (to choose 1 out of 3)

A. GREEN CHEMISTRY

OBJECTIVES:

To know the principle and importance of green chemistry. To understand the student green chemistry strategies for designing the chemical synthesis. To know the solvent free synthesis. To make the students knowledgeable ultrasound and microwave assisted green synthesis.

OUTCOMES:

Have the knowledge on 12 rules on green chemistry. Apply the attractive techniques in green synthesis. Use of ionic liquids, and polymer supported reagents in green synthesis. Apply the phase transfer catalysis in green synthesis.

UNIT- I: BASIC PRINCIPLES OF GREEN CHEMISTRY

Basic principles, prevention of waste/by-products, maximum incorporation of the reactants (starting materials and reagents) into the final product, prevention or minimization of hazardous products, designing safer chemicals, energy requirements for synthesis, selection of appropriate solvent, selection of starting materials, use of protecting groups, use of catalyst and products designed should be biodegradable.

UNIT- II: ULTRASOUND AND MICROWAVE ASSISTED GREEN SYNTHESIS

Ultrasound: Introduction, instrumentation, the phenomenon of cavitation. Sonochemical esterification, substitution, addition, alkylation, oxidation, reduction and coupling reactions.

Microwaves: Introduction, concept, reaction vessel/ medium, specific effects, atom efficiency (% atom utilization), advantages and limitations. N-alkylation and alkylation of active methylene compounds and Diels –Alder reactions. Reactions in water and reaction in organic solvents. Solvent free reactions and deprotection of esters.

UNIT- III: IONIC-LIQUIDS AS GREEN SOLVENTS

Introduction, structure, synthesis and applications of some important ionic liquids in organic synthesis.

Polymer supported reagents in green synthesis: Introduction - properties and advantages of polymer supported reagents and choice of polymers.

Substrate covalently bound to the support: Synthesis of oligosaccharides, intramolecular cyclisation. Selective chemical reactions on one aldehyde group of symmetrical aldehydes - Asymmetric synthesis.

Reagent linked to a polymeric material: Preparation of sulfonazide polymer and application in diazotransfer reaction. Synthesis of polymer bound per acid and its applications, synthesis of polystyrene tin dichloride resin and its applications.

Polymer supported catalytic reactions: Preparation of polymer supported AlCl₃ and applications - polymer supported photo sensitizers.

UNIT- IV: PHASE TRANSFER CATALYSIS IN GREEN SYNTHESIS

Introduction, mechanism of phase transfer catalyst reaction, types and advantages of phase transfer catalyst, types and applications of phase transfer reaction: Nitriles from alkyl or acyl halides, alkyl fluorides, alcohols, azides from alkyl halides, generation of dichlorocarbenes, addition to olefins, elimination reaction, alkylation reactions, Willamson synthesis, Benzoin condensation, Darzen reaction, Michael reaction, Wittig reaction, oxidation under PTC condition and reduction.

UNIT-V: INDUSTRIAL CASE STUDIES

Methyl Methacrylate (MMA)-Greening of Acetic acid manufacture, Vitamin-C- Leather manufacture-Types of Leather- Difference between Hide and Skin- Tanning –Reverse tanning-Vegetable tanning-Chrome tanning- Fat liquoring- Dyeing- Application-Polyethylene-Ziegler Natta Catalysis, Metallocene Catalysis- Eco friendly Pesticides-Insecticides.

Text Books:

- 1. New Trends in Green Chemistry, V. K. Ahluwalia, M. Kidwai, II Edn., Anamaya publishers New Delhi(2007).
- 2. Green Chemistry and Introductory text, Mike Lancaster, II Edition

3. Organic synthesis: Special techniques, V. K. Ahluwalia and R. Aggarwal, Narosa, New Delhi, 2003.

References:

- 4. Green Chemistry environment friendly alternatives, R. Sanghi and M M Srivastava, Narosa, New Delhi, 2003.
- 5. Green Chemistry an introduction text, Royal Society of Chemistry, UK, 2002
- 6. P. T. Anastas and J. C. Warner, Green Chemistry theory and Practice, Oxford University press. Oxford (1988).
- 7. Phase Transfer Catalysis in Organic Synthesis, W. B. Weber, G. W. Gokel, Springer, Berlin, 1977.
- Phase Transfer Catalysis, E. V. Dehmlov, S. S. Dehmlov, 2nd Edn., Verlagchemie, Wienhein, 1983.
- 9. Polymers as aids in Organic Synthesis, N. K. Mathur, C. K. Narang and R. E. Williams, Academic Press, NY, 1980.

PAPER-2

B. SUPRAMOLECULAR AND NANOCHEMISTRY

OBJECTIVES:

To know the student the basis of suprmolecular chemistry, metal-organic framework solids, nano materials and their applications. To understand the various techniques available to characterize the advanced nano materials. To identify the applications of nanotechnology.

OUTCOMES:

Understand the basic concepts of interaction in supramolecular structures. Adequate knowledge on supramolecular frame works and synthesis. Gain knowledge on synthesis and preparation of nanomaterials. Understand the nanomaterials characterization and applications.

UNIT-I: SUPRAMOLECULAR CHEMISTRY

Definition of supramolecular chemistry. Nature of binding interactions in supramolecular structures: ion-ion, ion-dipole, dipole-dipole, H-bonding, cation-p, anion-p, p-p, and vander Waals interactions. Supramolecular synthons.

Self-assembly molecules: Design, synthesis and properties of the molecules, selfassembling by H-bonding, metal-ligand interactions and other weak interactions, metallomacrocycles, catenanes, rotaxanes, helicates and knots.

UNIT-II: FRAMEWORK SOLIDS

Introduction-definition of porosity, pore size, pore volume, pore density-zeolitessynthesis and applications-metal organic frame work solids-definition-classificationsuses of different types of organic ligands- tuning of structure and properties - synthetic methods- advantage of MOF solids over zeolites- cracking of petroleum products

UNIT-III: SYNTHESIS OF SUPRAMOLECULES

Synthesis and structure of crown ethers, lariat ethers, podands, spherands, cyclophanes, cryptophanes, carcerands and hemicarcerands., Host-Guest interactions, lock and key analogy. Binding of cationic, anionic, ion pair and neutral guest molecules.

Molecular devices: molecular electronic devices, molecular wires, molecular rectifiers, molecular switches and molecular logic.

UNIT-IV: NANOCHEMISTRY

Introduction and definition of nanoparticles and nanomaterials, emergence of nanotechnology, challenges of nanotechnology. Synthesis of nanoparticles of ZnO_2 , TiO_2 , silver, gold, rhodium, palladium and platinum; carbon materials- fullerene- porous nano carbon (PNC).

Techniques of synthesis: Electroplating and electrophoretic deposition, conversion through chemicalreactions and lithography; Thin films: Chemical vapor deposition and atomic layer deposition techniques; Carbon fullerenes and nanotubes.

UNIT-V: ANALYTICAL CHARACTERIZATION AND APPLICATIONS

X-rays, Infrared, UV-Vis, Laser Raman, Electron microscopic techniques (SEM and TEM) - Thermal analysis (TG/DTA/DSC) methods.

Application of nanotechnology: modern technology in electronic, biological, consumer and domestic applications. Energy related application: photo-voltaic cells, energy storage nanomaterial. Drug delivery, drug targeting. Sensors and biosensors.

Reference Books

- 1. C.N.R. Rao, A. Muller, A.K. Cheetam (Eds), The Chemistry of Nanomaterials, Vol.1, 2, Wiley VCH, Weinheim, 2004
- 2. Nanochemistry, Kenneth J. Klabunde and G.B.Sergeev
- 3. G.Zhong Cao. Nanostructures and Nanomaterials: Synthesis, Properties and Applications, Imperial College Press (2004)
- 4. Metal-Organic Frameworks Applications from Catalysis to Gas Storage. Cejka, J, ed. (2011). Wiley-VCH. ISBN 978-3-527-32870-3
- 5. Zeolites and Catalysis: Synthesis, Reactions and Applications. Jiri Cejka; Avelino Corma; Stacey Zones (2010). John Wiley & Sons. ISBN 978-3-527-63030-1.

- 6. J.-M. Lehn; Supramolecular Chemistry-Concepts and Perspectives (Wiley-VCH, 1995)
- 7. P. D. Beer, P. A. Gale, D. K. Smith; Supramolecular Chemistry (Oxford University Press, 1999)
- 8. J. W. Steed and J. L. Atwood; Supramolecular Chemistry (Wiley, 2000).
- 9. C. P. Poole Jr, F. J. Owens, Introduction to nanotechnology, 2nd edition, Wiley-India, Delhi, 2008.
- 10. C. C. Kouch, Nanostructures materials: Processing, properties and applications, William Andrew publications, Newyork, 2002.
- 11. T. Pradeep, Nano: The essentials., McGrew Hill Education.(2007)

PAPER-2

C. MODERN SEPARATION TECHNIQUES

OBJECTIVES:

To learn the basic concept of chromatography. To understand the different chromatographic techniques. To study the applications of chromatography. To know the separation and purification methods.

OUTCOMES:

Have knowledge on principles on chromatography. Working knowledge on gas and HPCL chromatographic techniques. Adequate knowledge on application of ion-exchange chromatography. Understanding on solvent extraction and distillation techniques

UNIT-I: BASIC CONCEPTS OF CHROMATOGRAPHY

General description: Definitions, terms and parameters used in chromatography. Classification of chromatographic methods. Elution chromatography on columns. Migration rates of solutes, zone broadening, column efficiency and optimization of column performance.

UNIT-II GAS CHROMATOGRAPHY(GC)

Principles of gas-liquid chromatography, instrumentation, carrier gas, sample injection, column configuration and detection system (FID, TCD, ECD). Gas chromatographic columns (open tubular columns and packed columns) and stationary phases. Interfacing GC/MS.

UNIT-III: HIGH PERFORMANCE LIQUID CHROMATOGRAPHY (HPLC)

Column efficiency. Instrumentation: pumping system, sample injection system. Liquid chromatographic columns - types of column packing. Detectors: Absorbance detector and electrochemical detectors. Partition chromatography.

UNIT-IV: ION-EXCHANGE CHROMATOGRAPHY (IEC)

Definition, requirements for ion exchange resin. Synthesis and types of ion-exchange resins. Principle and basic features of ion - exchange reactions. Exclusion chromatography: Theory and principle of size exclusion chromatography. Experimental techniques of gel-filtration chromatography (GFC) and gel-permeation chromatography (GPC). Materials for packing-factors governing column efficiency. Methodology and applications.

M.Sc. Chemistry: Syllabus (CBCS)

UNIT-V: PURIFICATION AND EXTRACTION TECHNIQUES

Principle and techniques: Desiccants, precipitation: types of precipitation, factors affecting the precipitation. Distillation: fractional, steam, azeotropic, vacuum distillations. Recrystalization and sublimation.

Solvent extraction: Principle and techniques. Factors affecting the extraction efficiency: Ion association complexes, chelation, synergistic extraction and pH. Role of chelating ligands in solvent extraction. Introduction to solid phase extraction (SPE) and microwave assisted extraction (MAE) and applications.

REFERENCES

- 1. Fundamental of Analytical Chemistry, D.A. Skoog, D.M. West, Holler and Crouch, 8th Edition, 2005, Saunders College Publishing, New York.
- 2. Analytical Chemistry, G.D. Christian, 5th ed., 2001 John Wiley & Sons, Inc, India.

- 3. Quantitative Analysis, R.A. Day and A.L. Underwood, 6th edition, 1993, prentice Hall, Inc. New Delhi.
- Vogel's Textbook of Quantitative Chemical Analysis, J. Mendham, R.C. Denney, J.D. Barnes and M.J.K. Thomas, 6th edition, Third Inidan Reprint.2003 Pearson Education Pvt. Ltd., New Delhi.
- 5. Analytical Chemistry Principles, John H. Kennedy, 2nd edition, Saunders College Publishing, California, 1990.
- 6. Introduction to Chromatography Theory and practice, V.K.Srivastava, K.K.Srivastava, Chand &.Company Ltd , New Delhi
- 7. Principles of Instrumental Analysis, , D.A. Skoog,,F.James Holler, Timothy.A.Nieman ,Harcourt Asia (P) Ltd
- 8. Principles of Instrumental Analysis, D.A. Skoog, , Saunders College Pub. Co, III Edn., 1985
- 9. Text Book of Quantitative Organic Analysis A.I Vogel, , ELBS III Edn, 1987.
- 10. Fundamentals of Analytical Chemistry, D.A. Skoog and D. M. West, Holt Rinehart and Winston Publications, IV Edn, 2004.
- 11. Instrumental Methods of Analysis, Willard, Merit, Dean and Settle, , CBS Publishers and Distributors, IV Edn., 1989
- 12. G. D. Christian and J. E. O. Reilly, Instrumental Analysis, Allyn and Bacon Inc, II Edn., 1988.
- 13. R. M. Upadhyay, Instrumental & Analytical Chemistry Principles & Procedure Kalyani Publishers(2002).

OPEN ELECTIVE (NON MAJOR) PAPER-II (To choose 1 out of 3)

A. MEDICINAL CHEMISTRY

OBJECTIVES:

To make the students learn the concept of medicinal chemistry To understand the various sourcesand classification of drugs To learn the importance of Chemotherapy To study about the common body ailments To understand about health promoting drugs **OUTCOMES:** The students will be able to Appreciate the importance of medicinal chemistry Acquire knowledge of classification of drugs Identify the importance of Chemotherapy Acquire knowledge of common body ailments Illustrte the importance of health promoting drugs

UNIT I-INTRODUCTION Common diseases – infective diseases – insect – borne, air – borne and water-borne – hereditary diseases – Terminology – drug, pharmacology, antimetabolites, absorption of drugs – factors affecting absorption –therapeutic index (Basic concepts only)

UNIT II-DRUGS Various sources of drugs, pharmacologically active constituents in plants, Indian medicinal plants – tulsi, neem, keezhanelli – their importance – Classification of drugs – biological chemical (Structure not required) Drug receptors and biological responses – factors affecting metabolism of drugs. (Basic concepts only)

UNIT III-CHEMOTHERAPY Drugs based on physiological action, definition and two examples each of anesthetics- General and local – analgesics – narcotic and synthetic – Antipyretics and anti inflammatory agents – antibiotics – Penicillin, Streptomycin, Antivirals, AIDS – symptoms, prevention, treatment – Cancer (Structure not required)

UNIT IV-COMMON BODY AILMENTS

Diabetes – Causes, hyper and hypoglycemic drugs – Blood pressure – Sistolic & Diastolic Hypertensive drugs – Cardiovascular drugs – depressants and stimulants – Lipid 128 profile – HDL, LDL cholesterol lipid lowering drugs. (Structure not required)

UNIT V-HEALTH PROMOTING DRUGS Vitamins A,B, C, D, E and K micronutrients – Na, K, Ca, Cu, Zn and I, Medicinally important inorganic compounds of A1, P, As, Hg and Fe, Examples and applications, Agents for kidney function (Aminohippuric acid). Agents for liver function (Sulfo bromophthalein), antioxidants, treatment of ulcer and skin diseases. (Structure not required)

RECOMMENDED TEXT BOOKS:

- 1. S.Lakshmi Pharmaceutical Chemistry, S.Chand & Sons, New Delhi, 2004
- 2. V.K. Ahluwalia and Madhu Chopra, -Medicinal Chemistry, Ane Books, New Delhi, 2008
- 3. P.Parimoo, A Text Book of Medicinal Chemistry, CBS publishers, New Delhi, 2006

RECOMMENDED REFERENCE BOOKS

- 1. Ashutosh Kar, --Medicinal Chemistryl, Wiley Eastern Ltd., New Delhi, 1993,
- 2. David William and Thomas Lemke, Foyes Principles of Medicinal Chemistry, BI Publishers.
- 3. Romas Nogrady, Medicinal Chemistry, Oxford Univ. Press 129

PAPER-II (To choose 1 out of 3)

B.TEXTILE CHEMISTRY

OBJECTIVES:

To make the students learn the concept of textile chemistry To understand about synthetic fibres To learn the importance of raw cotton To study about the dyeing process To understand about finishes given to fabrics **OUTCOMES:** Appreciate the importance of textile chemistry Acquire knowledge of synthetic fibres Identify the importance of raw cotton

Acquire knowledge of dyeing Illustrate the importance of finishes given to fabrics

UNIT I : 1. General classification of fibres-chemical structure, production, properties and uses of the following natural fibres (a)natural cellulose fibres (cotton and jute) (b) natural protein fibre (wool and silk).

UNIT II : Chemical structure, production, properties and uses of the following synthetic fibres. (i) Man made cellulosic fibres (Rayon, modified cellulose fibres) (ii) Polyamide fibres (different types of nylons) (iii) Poly ester fibres.

UNIT III : Impurities in raw cotton and grey cloth, wool and silk- general principles of the removal – Scouring – bleaching – Desizing – Kierboiling- Chemicking.

UNIT IV : Dyeing - Dyeing of wool and silk –Fastness properties of dyed materials – dyeing of nylon, terylene and other synthetic fibres.

UNIT V : Finishing- Finishes given to fabrics- Mechanical finishes on cotton, wool and silk, method used in process of mercerizing –Anti-crease and Anti-shrink finishes –Water proofing. 117

Reference

1. Chemical Technology of fibrous Materials – F.sadov, M.Horchagin and A.Matetshy, Mir Publishers.

2. The Identification of Textile Fibres - Bruno Nuntak.

3. Introduction to Textile Science -3rd edition, Maryory L.Joseph.

4. Textile Chemistry - Vol.II R.H.Peters, Elserier, Avesterdam.

5. Dyeing and chemical Technology of Textile fibres-5th Edition, E.R.Trotman, Charles Griffin & Co Ltd

6. Chemistry of dyes & Principles of Dyeing -V.A. Shenai, Sevak Publications.

7. Scouring and Bleaching E.R.Trotman, Charles Griffin & Co Ltd.

PAPER-II (To choose 1 out of 3)

C.DAIRY CHEMISTRY

OBJECTIVES:

To make the students learn about diary chemistry To understand the importance of mikl-lipids, proteins, carbohydrates and vitamins To learn the importance of creams To understand the importance of dairy detergents To study about the milkpowder and ice-cream **OUTCOMES:** The students will be able to Identify the importance of diary chemistry Acquire knowledge of mikl-lipids, proteins, carbohydrates and vitamins Appreciate the importance of creams Acquire knowledge of milk powder and ice- creams

Illustrate the importance of diary detergents

UNIT I : Milk: General composition of milk factors affecting the gross composition of milk, physico-Chemical change taking place in milk due to processing parameters-boiling pasteurization- sterilization and homogenization.

UNIT II : 1. Milk lipids-terminology and definitions 2. Milk proteins:. Physical properties of milk proteins-Electrical properties and hydration, solubility. Reaction of milk proteins with formaldehyde and ninhydrin. 3. Milk carbohydrate-Lactose- Estimation of lactose in milk. 4. Milk vitamins-water and soluble vitamins, effect of heat and light on vitamins. 5. Ash and mineral matters in milk.

UNIT III : 1. Creams : Definition-composition-chemistry of creaming process- gravitational and centrifugal methods of separation of cream-Factors influencing cream separation (Mention the factors only)-Cream neutralization. Estimation of fat in cream. 2. Butter : Definition-% composition-manufacture-Estimation of fat, acidity, salt and moisture content-Desi butter. 113

UNIT IV : 1. Milk powder : Definition-need for making powder-drying process- spraying, drum drying, jet drying and foam drying-principles involved in each. Manufacture of whole milk powder by spray drying process-keeping quality of milk powder. 2. Ice cream : Definition-percentage composition-types- ingredients needed -manufacture of ice-cream stabilizers-emulsifiers and their role.

UNIT V : Dairy Detergents : Definition-characteristics-classification-washing procedure (modern method) sterilization-chloramin-T and hypochlorite solution.

Reference Books 1. Outlines of Diary Technology-Sukumar De 2. Principles of Dairy Chemistry-Robert Jenness & S.Patorn.

3. Indian Diary products-K.S. Rangappa and K.T. Achaya.

ANNAMALAI UNIVERSITY

BACHELOR OF COMPUTER SCIENCE

CBCS PATTERN (2021 - 2022)

		Study Components Course Title		Ins.			Maximum Marks		
S. No.	Part			Hrs / week	Credit	Title of the Paper			
		SEMESTER I					CIA	Uni. Exam	Total
1	Ι	Language	Paper-1	6	4	Tamil/Other Languages	25	75	100
2	П	English (CE)	Paper-1	6	4	Communicative English I	25	75	100
3	Ш	Core Theory	Paper-1	6	4	Programming in C	25	75	100
4	III	Core Practical	Practical-1	3	2	Programming in C Lab	25	75	100
5	111	Allied -1	Paper-1	7	3	(to choose any one) 1. Mathematics I 2. Mathematical Foundations I	25	75	100
6	III	PE	Paper 1	6	3	Professional English I	25	75	100
7	IV	Environmental Studies		2	2	Environmental studies	25	75	100
		Sem. Total		36	22		175	525	700
		SEMESTER II					CIA	Uni. Exam	Total
7	I	Language	Paper-2	6	4	Tamil/Other Languages	25	75	100
8	П	English (CE)	Paper-2	6	4	Communicative English II	25	75	100
9	III	Core Theory	Paper-2	5	4	C++ & Data Structure	25	75	100
10	ш	Core Practical	Practical-2	2	2	C++ and Data Structures Lab	25	75	100
11	111	Allied-1	Paper-2	7	5	to choose any one) 1. Mathematics II 2. Mathematical Foundations II	25	75	100
12	Ш	PE	Paper 1	6	3	Professional English II	25	75	100
13	IV	Value Education		2	2	Value Education	25	75	100
14	IV	Soft Skill		2	1	Soft Skill	25	75	100
		Sem. Total		36	25		200	600	800

ANNAMALAI UNIVERSITY BACHELOR OF COMPUTER SCIENCE

SYLLABUS UNDER CBCS (2021 - 2022)

SEMESTER I

CORE THEORY PAPER -1

PROGRAMMING IN C

OBJECTIVES:

- \checkmark To understand simple algorithms,
- ✓ To understand language constructs
- \checkmark To understand and develop programming skills in C.
- \checkmark To understand the basic concepts of decision making and looping statements.
- \checkmark To understand the concepts of arrays , structures, union, pointers and files.

UNIT – I

Overview of C: History – Importance – Sample Programs – Basic Structure – Programming Style – Executing – Unix System – MS-DOS System - **Constants, Variables, and Data Types:** Character Set – C Token – Keyword and Identifiers – Constants – Variables – Data Types – Declaration of Storage Class – Assigning Values to Variables – Defining Symbolic Constants – Declaration – Overflow and Underflow of Data - **Operators and Expressions:** Arithmetic, Relational, Logical, Assignment, Increment and Decrement, Conditional, Bitwise, Special Operators – Arithmetic Expressions, Evaluation of Expressions – Precedence of Arithmetic Operators – Some Computational Problems – Type Conversions in Expressions – Operator Precedence and Associativity – Mathematical Functions.

UNIT – II

Managing Input and Output Operations: Reading, Writing a Character – Formatted Input, Output - **Decision Making and Branching:** Decision Making with If statement – Simple If Statement – The If...Else Statement – Nesting of If...Else Statements – The Else If Ladder – The Switch Statement- The ?: Operator – The Goto Statement - **Decision Making and Looping:** The while Statement – The do Statement – The for Statement – Jumps in Loops – Concise Test Expressions.

UNIT – III

Arrays: One-Dimensional Arrays - Declaration, Initialization of One-Dimensional Arrays – Two-Dimensional Arrays - Initializing Two-Dimensional Arrays – Multi-Dimensional Arrays – Dynamic Arrays - **Character Arrays and Strings:** Declaring and Initializing String Variables – Reading Strings from Terminal – Writing Strings to Screen – Arithmetic Operations on Characters – Putting String Together – Comparison of Two Strings –String-Handling Functions – Table of Strings – Other Features of Strings - **User Defined Functions**: Need for User-Defined Functions – A Multi-Function Program – Elements of User-Defined Functions – Definition of Functions – Return Values and Their Types – Function Calls – Function Declaration – Category of Functions – No Arguments and No Return Values – Arguments but no return values – Arguments with Return Values – No Arguments but Returns a value – Functions that Return Multiple Values – Nesting of Functions – Recursion – Passing Arrays, Strings to Functions – The Scope, Visibility and Lifetime of Variables – Multi file Programs.

$\mathbf{UNIT} - \mathbf{IV}$

Structure and Unions: Defining a Structure – Declaring Structure Variables – Accessing Structure Members – Structure Initialization and Copying and Comparing Structure Variable – Operations on Individual Members – Arrays of Structures – Arrays within Structures – Structures within Structures – Structures and Functions – Unions – Size of Structures – Bit Fields **Pointers:** Understanding Pointers – Accessing the Address of Variable – Declaring, Initialization of Pointer Variables – Accessing a Variable through its pointer – Chain of Pointers – Pointer Expression – Pointer Increments and Scale Factor – Pointers and Arrays – Pointers and Character Strings – Array of Pointers – Pointers as Function Arguments – Functions Returning Pointers – Pointers to Functions – Pointers and Structures – Troubles with Pointers **File Management in C**: Defining and Opening a File – Closing a File – Input/Output Operations on File – Error Handling During I/O Operations – Random Access to Files – Command Line Arguments.

UNIT – V

Fundamental Algorithms: Exchanging the values of Two Variables- Counting- Summation of a Set of Numbers-Factorial Computation -Sine Function Computation –Generation of the Fibonacci Sequence-Reversing the Digits of an Integer- Base Conversion – Character to Number Conversion - Factoring Methods: Finding the square Root of a Number –The Smallest Divisor of an Integer-The Greatest Common Divisor of the two integers-Generating Prime Numbers- Computing the Prime Factors of an integer –Generation of Pseudo-random Numbers-Raising a Number to a Large Power-Computing the nth Fibonacci Number (Chapters: 2 & 3)

TEXT BOOK:

1. Programming in ANSI C, E. Balagurusamy, Tata McGrawhill Education, 6th Edition, 2013. (Unit I to IV)

2. How to Solve it by Computer, R.G.Dromey, PHI International (Unit V)

REFERENCE BOOKS:

1. The C Programming Language (ANSI C), Kernighan, B.W. and Ritchie, D.M., PHI. 2. C by Discovery , Foster & Foster , Penram International Publishers, Mumbai.

E - REFERENCES

1. NPTEL, Introduction to C Programming, Prof.SatyadevNandakumar ,IIT, Computer Science and Engineering Kanpur.

2. NPTEL, Introduction to Problem Solving & Programming, by Prof. Deepak Gupta Department of Computer Science and Engineering IIT Kanpur.

Course Outcomes:

- The Student will be able to understand the concepts of Constants, Variables, and Data Types, Operators and Expressions
- The Student will be able to understand the concepts of Managing Input and Output Operations, Decision Making and Branching, Decision Making and Looping.
- The Student will be able to understand the concepts of Arrays, Character Arrays and Strings, User Defined Functions.
- The Student will be able to understand the concepts of Structure and Unions, Pointers, File Management in C.
- The Student will be able to understand the concepts of Fundamental Algorithms, Factoring Methods.

CORE PRACTICAL-1

Programming in C - Lab

Objectives:

- 1. To understand concepts of for/while loop and switch.
- 2. To understand language Functions and recursions.
- 3. To understand and develop String Manipulations.
- 4. To understand the basic concepts of searching and sorting.
- 5. To understand the concepts of structures.

Control Statements:

- 1. Print n Fibonacci numbers (using for)
- 2. Print n Prime numbers (using while)
- 3. Simple arithmetic on two numbers (using switch/case)

Functions:

4. Swap two values using call by value / call by reference.

Recursion:

- 5. To compute NcR and NpR
- 6. To Compute GCD and LCM

String Manipulation.

7. Operations on string such as length, concatenation, reverse, counting, and copy of a string to another.

Matrices:

8. Matrix Addition, Subtraction, Multiplication, Transpose of n x m matrices.

9. Inverse of a square matrix.

Searching:

10. Binary Search.

Sorting: 11. Bubble Sort

12. Insertion Sort

Structures:

13. Students Mark statement

Pointers:

14. Arithmetic operations on pointers.

Files

15. Creating/ Reading/ Writing a text/binary file.

REFERENCE BOOK:

 Programming in ANSI C, E. Balagurusamy, Tata McGrawhill Education, 6th Edition, 2013.

Outcomes:

- Enhance the analyzing and problem solving skills and use the same for writing programs in C.
- Write diversified solutions, draw flowcharts and develop a well-documented and indented program according to coding standards.
- Learn to debug a given program and execute the C program.
- To have enough practice the use of conditional and looping statements.
- To implement arrays, functions and pointers.

ALLIED PAPER -1 1. MATHEMATICS – I

Objectives of the Course:

To Explore the Fundamental Concepts of Mathematics

UNIT-I: ALGEBRA

Partial Fractions - Binomial, Exponential and logarithmic Series (without Proof) - Summation - Simple problems

UNIT-II : THEORY OF EQUATIONS

Polynomial Equations with real Coefficients - Irrational roots - Complex roots-Transformation of equation by increasing or decreasing roots by a constant -Reciprocal equations - Newton's method to find a root approximately - Simple problems.

UNIT-III : MATRICES

Symmetric - Skew-Symmetric - Orthogonal and Unitary matrices - Eigen roots and eigen vectors – Cayley - Hamilton theorem (without proof)-Verification and computation of inverse matrix

UNIT-IV: TRIGONOMETRY

Expansions of $\sin^n \theta$, $\cos^n \theta$, $\sin n\theta$, $\cos n\theta$, $\tan n\theta$ - Expansions of $\sin \theta$, $\cos \theta$, $\tan \theta$ in terms of θ .

UNIT-V: DIFFERENTIAL CALCULUS

Successive differentiation upto third order, Jacobians -Concepts of polar coordinates-Curvature and radius of curvature in Cartesian co-ordinates and in polar coordinates.

Recommended Text:

P.Duraipandian and S.Udayabaskaran,(1997) *Allied Mathematics*, Vol. I & II.Muhil Publishers, Chennai.

Reference Books:

- 1. P.Balasubramanian and K.G.Subramanian,(1997) *Ancillary Mathematics*. Vol. I & II. Tata McGraw Hill, New Delhi.
- 2. S.P.Rajagopalan and R.Sattanathan,(2005) *Allied Mathematics* .Vol. I & II. VikasPublications, New Delhi.
- 3. P.R.Vittal (2003) Allied Mathematics .Marghan Publications, Chennai
- 4. P.Kandasamy, K.Thilagavathy (2003) Allied Mathematics Vol-I, II S.Chand& company Ltd., New Delhi-55.
- 5. Isaac, Allied Mathematics. New Gamma Publishing House, Palayamkottai.

ALLIED 1

PAPER - I

2. MATHEMATICAL FOUNDATIONS - I

Objectives

To know about Logical operators, validity of arguments, set theory and set operations, relations and functions, Binary operations, Binary algebra, Permutations & Combinations, Differentiation, Straight lines, pair of straight lines, Circles, Parabola, Ellipse, Hyperbola.

UNIT-I: SYMBOLIC LOGIC

Proposition, Logical operators, conjunction, disjunction, negation, conditional and bi-conditional operators, converse, Inverse, Contra Positive, logically equivalent, tautology and contradiction. Arguments and validity of arguments.

UNIT-II: SET THEORY

Sets, set operations, venndiagram, Properties of sets, number of elements in a set, Cartesian product, relations & functions,

Relations : Equivalence relation. Equivalence class, Partially and Totally Ordered sets,

Functions: Types of Functions, Composition of Functions.

UNIT-III: BINARY OPERATIONS

Types of Binary Operations: Commutative, Associative, Distributive and identity, Boolean algebra: simple properties. Permutations and Combinations.

UNIT-IV: DIFFERENTIATION

Simple problems using standard limits,

 $\begin{array}{c} (1+1/n)^n, \text{ lt } (1+n)\\ \text{Lt } \underline{x^n-a^n}, \text{ lt } \underline{\sin x}, \text{ lt } \underline{\tan x \text{ lt }} e^{\underline{x}-1}, \text{ lt } \underline{1/n}\\ \text{X } \overline{x-a} x \xrightarrow{\bullet} x x \xrightarrow{\bullet} x x 0 \xrightarrow{\bullet} n 0 \xrightarrow{\bullet} n 0 \xrightarrow{\bullet} \end{array}$

Differentiation, successive differentiation, Leibnitz theorem, partial differentiation, Applications of differentiation, Tangent and normal, angle between two curves.

UNIT-V: TWO DIMENSIONAL ANALYTICAL GEOMETRY

Straight Lines - Pair Straight Lines

Text Book.

P.R. Vittal, Mathematical Foundations – Maragham Publication,

Chennai.

Reference Books

- 1. U. Rizwan, Mathematical Foundation SciTech, Chennai
- 2. V.Sundaram& Others, Dircrete Mathematical Foundation A.P.Publication, sirkali.
- 3. P.Duraipandian& Others, Analytical Geometry 2 Dimension Emerald publication 1992 Reprint.
- 4. Manicavachagompillay&Natarajan. Analytical Geometry part I Two Dimension S.Viswanathan (printers & publication) Put Ltd., 1991.

SEMESTER II

CORE THEORY PAPER -2

C++ & DATA STRUCTURES

Objectives:

- 1. To understand the concepts of object-oriented programming and master OOP using C++.
- 2. To understand the concepts of Inheritance, polymorphism and templates.
- 3. To understand the concepts of different view of data, stack and queues.
- 4. To understand the concepts of Programming with Recursion, Binary Search Tree and graphs.
- 5. To understand the concepts of Sorting and Searching Algorithms.

UNIT-I:

Principles of Object Oriented Programming – Beginning with C++ – Token, Expressions and Control Structures- Functions in C++ - Classes and Objects - Constructors and Destructors.

UNIT-II:

Operator Overloading and Type Conversions - Inheritance : Extending Classes -Pointers, Virtual Functions and Polymorphism - Managing Console I/O Operations. Working with Files - Templates - Exception Handling - Manipulating Strings.

UNIT-III:

Data Design & implementations: Different views of data – Abstraction and Built-in Types – Arrays ADTs Stacks and Queue (Linear and Linked), Stack (Array and Pointer)- Applications- Infix to Postfix Conversions - Queue(Array and Pointer) -List(Array and Pointer) – Applications: (Polynomial Addition) - Doubly Linked Lists.

UNIT – IV:

Programming with Recursion : Recursion – Verifying and Writing Recursive Functions - Binary Search Tree : Implementation - Tree Traversal - Graphs: Implementations -BFS – DFS – Dijkstras Shortest Path Algorithm. (Chapter 7: Section 7.1,7.4 7.5, Chapter 8:Section 8.1,8.4, Chapter 9:Section 9.3)

UNIT-V:

Sorting and Searching Algorithms: Sorting – Searching – Hashing (Chapter 10: Section 10.1, 10.2, 10.3)

TEXT BOOK:

1. Object Oriented Programming with C++, E Balagurusamy, Tata McGraw Hill, 6th Edition, 2014.

(Units I, II)

2. C++ Plus Data Structure, Nell Dale, Jones & Bartlett Publishers , $4{\rm th}$ Edition, 2010. (Units III, VI & V)

REFERENCES:

1. C++ The Complete Reference, Herbert Schildt, Tata McGraw Hill, 4th Edition, 2003.

2. OOP In ANSI C and Turbo C, Ashok N.Kamthene, Pearson Education, 6th Edition, 2008.

3. Data Structures and Algorithms, Alfred V. Aho, Jeffrey D. Ullman, John E. Hopcroft, Addison Wesley Longman Inc., 2nd Edition, 1999.

Course Outcomes:

- The Student will be able to understand the concepts of object oriented programming Apply structure and inline functions.
- The Student will be able to understand the concepts of the types of inheritances and Applying various levels of Inheritance for real time problems Apply the OOPs concepts class and object. Understand Explain the file concept and exception handlings in C++
- The Student will be able to understand the concepts of Stacks and Queue using array and pointers.
- The Student will be able to understand the concepts of Recursion, Binary Search Tree and graphs.
- The Student will be able to understand the concepts of Sorting and Searching Algorithms.

CORE PRACTICAL-2

C++ & DATA STRUCTURES LAB

Objectives:

- 1. To develop C++ programming skills in design
- 2. To understand the basic concepts of different abstract types and structure of data.
- 3. To understand the concepts of Function Overloading
- 4. To understand the concepts of Stack, Queue, List, Doubly Linked List using Pointers-using Arrays.
- 5. To understand the concepts of Searching and Sorting Algorithms.

LIST OF LAB EXERCISES

- 1. Constructors & Destructors, Copy Constructor.
- 2. Friend Function & Friend Class.
- 3. Inheritance.
- 4. Polymorphism & Function Overloading.
- 5. Virtual Functions.
- 6. Overload Unary & Binary Operators Both as Member Function & Non Member Function.
- 7. Class Templates & Function Templates.
- 8. Exception Handling Mechanism.
- 9. Standard Template Library concept.
- 10. File Stream classes.
- 11. Array implementation of Stack, Queue : Infix to postfix
- 12. Implementation of Stack, Queue, List, Doubly Linked List using Pointers-
- Polynomial Addition
- 13. Implementation of Binary Search Tree, Traversal
- 14. Implementation of Searching and Sorting Algorithms.
- 15. Graph Implementation of shortest path (Djikstras)

REFERENCE:

- 1. Object Oriented Programming with C++, E Balagurusamy , Tata McGraw Hill, 6th Edition, 2014.
- 2. C++ Plus Data Structure, Nell Dale, Jones & Bartlett Publishers, 4th Edition, 2010.

Course Outcomes:

- Understand the Creating and Deleting the Objects with the Concepts of Constructors and Destructors.
- Demonstrate the Polymorphism Concepts and Operator Overloading.
- Understand basic Data Structures such as Arrays, Linked Lists, Stacks, Queues, Doubly Linked List and Infix to Postfix Conversion.
- Apply Algorithm for solving problems like Sorting and Searching.
- Apply Algorithms and use Graphs and Trees as tools to visualize and simplify Problems

ALLIED 1

PAPER -2

1. MATHEMATICS II

Objectives of the Course

To Explore the Fundamental Concepts of Mathematics

UNIT-I: Application of Integration

Evaluation of double, triple integrals - Simple applications to area, volume - Fourier series for functions in (0,2] and $\square \square \square \square \square \square$

UNIT-II: Partial Differential Equations

Formation, complete integrals and general integrals - Four standard types, Lagrange's equations.

UNIT-III: Laplace Transforms

Laplace Transformations of standard functions and simple properties - Inverse Laplace transforms - Applications to solutions of linear differential equations of order 1 and 2-simple problems

UNIT-IV: Vector Analysis

Scalar point functions - Vector point functions - Gradient, divergence, curl - Directional derivatives - Unit to normal to a surface.

UNIT-V: Vector Analysis (continued)

Line and surface integrals - Guass, Stoke's and Green's theorems (without proofs) - Simple problem based on these Theorems.

Recommended Text

P.Duraipandian and S.Udayabaskaran,(1997) *Allied Mathematics*, Vol. I & II.Muhil Publishers, Chennai

Reference Books:

- 1. P.Balasubramanian and K.G.Subramanian,(1997)*Ancillary Mathematics*. Vol. I & II. Tata McGraw Hill, New Delhi.
- 2. S.P.Rajagopalan and R.Sattanathan,(2005) *Allied Mathematics* .Vol. I & II.Vikas Publications, New Delhi.
- 3. P.R.Vittal(2003). Allied Mathematics .Marghan Publications, Chennai.
- 4. P.Kandasamy, K.Thilagavathy (2003) Allied Mathematics Vol-I, II S.Chand& company Ltd., New Delhi-55.
- 5. Isaac, Allied Mathematics. New Gamma Publishing House, Palayamkottai

ALLIED 1

PAPER -2

2. MATHEMATICAL FOUNDATIONS II

Objectives

To know about Matrix Operations, Symmetric, Skew-Symmetric, Hermitian, Skew-Hermitian, Orthogonal, Unitary Matrices. Rank of a Matrix Solutions of linear equations Consistency and Inconsistency, Characteristic roots and Characteristics Vectors, Cayley - Hamilton Theorem, Integration of rational functions, Integration by parts, Reduction formulae, Area and volume using integration, Planes, Straight lines, Spheres, Curves, Cylinders.

UNIT-I: MATRICES

Multiplication of matrices, Singular and Non-Singular matrices, Adjoint of a Matrix, Inverse of a matrix Symmetric and Skew-Symmetric, Hermitian and Skew-Hermition, Orthogonal and unitary matrices, Rank of a matrix, Solution of Simultaneous Linear equations by

- (i) Cramer's rule.
- (ii) Matrix Inversion Method.

UNIT-II: MATRICES

Test for Consistency and Inconsistency of linear equations, (Rank Method), characteristic roots and characteristic vectors, Cayley - Hamilton theorem, matrix of linear transformations: reflection about the x, y axes and the line y=x, rotation about the origin through an angle, expansion or compression, shears, translation.

UNIT-III

Integration Simple problems, integration of rational function involving algebraic expressions of the form

1 , 1 , px+q px+q ,px+q ax^2+bx+c $ax^2+bx+cax^2+bx^2+bx+cax^2+bx+cax^2+bx+cax^2$

integrations using simple substitutions integrations involving trigonometric functions of the form

<u> 1 , 1 ,</u>

a+bcosx $a^2 \sin^2 x + b^2 \cos^2 x$ Integration by parts.

UNIT-IV

Properties of definite integrals. Reduction formulae for

 $\int x^n e^{ax} dx$, $\sin^n x dx$, $\cos^{nx} dx$, $\int x^m (1-x)^n dx$, applications of integration for (i) Area under plane caurves, (ii) Volume of solid of revolution.

UNIT-V: ANALYTICAL GEOMETRY OF THREE

DIMENSION

Planes, straight lines.

Text Book.

P.R.Vittal, Mathematical Foundations - Margham Publication,

Chennai.

Reference Books

- 1. U. Rizwan, Mathematical Foundation SciTech, Chennai
- 2. V.Sundaram& Others, Dircrete Mathematical Foundation A.P.Publication, sirkali.
- 3. P.Duraipandian& Others, Analytical Geometry 3 Dimension Emerald publication 1992 Reprint.
- 4. Manicavachagompillay&Natarajan. Analytical Geometry part II three Dimension S.Viswanathan (printers & publication) Put Ltd., 1991.

ANNAMALAI UNIVERSITY MASTER OF COMPUTER SCIENCE (2021 - 2022)

The course of Study and scheme of Examination

S.No Study Components		Ins. Credit		Title of the Paper	Maximum Marks			
Course Title		Hrs./						
			week			CIA	Uni. Exam	Total
SEMESTER 1					Ехаш			
1	Core	Paper - 1	5	3	Relational Database Management System	25	75	100
2	Core	Paper - 2	5	3	Enterprise Java Programming	25	75	100
3	Core	Paper - 3	5	3	Programming using C#.NET	25	75	100
4	Practical	Paper - 1	3	2	Practical 1:Relational Database Management System	25	75	100
5	Practical	Paper - 2	3	2	Practical 2: Enterprise Java Programming	25	75	100
6	Practical	Paper - 3	3	2	Practical 3: Programming using C#.NET	25	75	100
		Inte	rnal Elect	tive for sa	me major students (Choose any one)			
7	Core Elective	Paper - 1	3	3	A. Computer OrganizationB. Parallel ComputingC. Embedded System	25	75	100
	I	External N	lajor for c	other majo	or Students (Inter/multi-disciplinary pages)	pers)		
8	Open Elective	Paper - 1	3	3	A. E-CommerceB. Introduction to Computer ApplicationsC. Principles of Internet	25	75	100
			30	21				800
						1		
SEMESTER II				CIA	Uni. Exam	Total		
1	Core	Paper - 4	5	3	Advanced Enterprise Java Programming	25	75	100
2	Core	Paper - 5	4	3	Design and Analysis of Algorithm	25	75	100
3	Core	Paper - 6	4	3	Web Application using C#.NET	25	75	100
4	Practical	Paper - 4	3	2	Practical 4: Advanced Enterprises Java Programming	25	75	100
5	Practical	Paper - 5	3	2	Practical 5: Design and Analysis of Algorithm	25	75	100
6	Practical	Paper - 6	3	2	Practical 6: Web Application using c#.NET	25	75	100
		Inte	rnal Elect	tive for sa	me major students (Choose any one)			
7	Core Elective	Paper - 2	3	3	A. Human Computer InteractionB. Social Information N/WC. Cloud Computing	25	75	100
	External Major for other major Students (Inter/multi-disciplinary papers)							
8	Open Elective	Paper – 2	3	3	A. Principles of Web DesignB. Open Source ApplicationsC. Problem Solving Techniques	25	75	100
9	*Field Study		-	2		100	-	100
10	Compulsory Paper		2	2	Human Rights	25	75	100
1			30	25				1000

*Field Study

There will be field study which is compulsory in the first semester of all PG courses with 2 credits. This field study should be related to the subject concerned with social impact. Field and topic should be registered by the students in the first semester of their study along with the name of a mentor before the end of the month of August. The report with problem identification and proposed solution should be written in not less than 25 pages in a standard format and it should be submitted at the end of second semester. The period for undergoing the field study is 30 hours beyond the instructional hours of the respective programme. Students shall consult their mentors within campus and experts outside the campus for selecting the field and topic of the field study. The following members may be nominated for confirming the topic and evaluating the field study report.

- i) Head of the respective department
- ii) Mentor
- iii) One faculty from other department

ANNAMALAI UNIVERSITY

M.Sc. COMPUTER SCIENCE

SYLLABUS

UNDER CBCS

(2021-2022)

[SEMESTERI: CORE]

[Hrs: 5/Credits: 3]

RELATIONAL DATABASE MANAGEMENT SYSTEM

COURSE OBJECTIVES

- To have a broad understanding of database concepts and database management system software
- To have a high-level understanding of major DBMS components and their function
- To be able to model an application's data requirements using conceptual modeling tools like ER diagrams and design database schemas based on the conceptual model.
- To be able to write SQL commands to create tables and indexes, insert/update/delete data, and query data in a relational DBMS.
- To be able to program a data-intensive application using DBMS APIs.

COURSE OUTCOMES

CO1 - Students are able to have a broad understanding of database concepts and databasemanagement system software

CO2 - Students are able tohave a high-level understanding of major DBMS components and their function

CO3 - Students are able tomodel an application's data requirements using conceptualmodeling tools like ER diagrams and design database schemas based on theconceptual model.

CO4 - Students are able towrite SQL commands to create tables and indexes, insert/update/delete data, and query data in a relational DBMS.

CO5 - Students are able toprogram a data-intensive application using DBMS APIs.

UNIT-I: INTRODUCTION

File System Vs. DBMS - Database System Applications - View of Data-Database language - Database design - ER Model _ Relational Model - Network Data Model - Hierarchical Data Model - Data Storage & Querying - Data Architecture.

UNIT-II: RELATIONAL MODEL

Relational Model - Structure of Relational Databases - Relational Algebra and Calculus -SQL - Basic Structure - Set Operations - Aggregate Functions - Null Values - Nested Queries - Complex Queries - Views - Modification of the Database - Advanced SQL - Triggers.

UNIT-III: FUNCTIONAL DEPENDENCIES

Functional Dependencies - Features of Relational designs - Decomposition and Normalization using Functional Dependencies and Multivalued Dependencies - Join dependencies- Domain key Normal form.

UNIT- IV: PHYSICAL STORAGE MEDIA

Overview of Physical Storage Media - Magnetic disks - RAID - tertiary Storage - File Organization - Organization of records in Files - Indexing and Hashing - Ordered Indices -B+ -Tree Index Files - B-Tree Index Files - multiple Key Access - Static and Dynamic Hashing - Query Processing - Transaction Management - Transactions - Concurrency.

UNIT-V: DISTRIBUTED DATABASES

Distributed Databases - Homogeneous and Heterogeneous Databases - Distributed Data Storage - Distributed Transactions - Commit Protocols - Concurrency Control - Object Based Databases - Complex Data types - Structured Types and Inheritance in SQL – Object identity and Reference - Types in SQL - XML - structure of XML data - XML Document - Schema -Querying and Transformation - Data Mining and Data Warehousing.

TEXT BOOK

1. Abraham Silberschatz, Henry F. Korth and S. Sudarshan- "Database System Concepts", FifthEdition,McGraw-Hill,2006.

REFERENCES

1. Raghu Ramakrishnan and Johannes Gehrke, "Database Management Systems", Tata McGraw-Hill Publishing Company, 2003.

2. Ramez Elmasri and Shamkant B. Navathe, "Fundamental Database Systems", Third Edition, Pearson Education, 2003.

3. Hector Garcia–Molina, Jeffrey D.Ullman and Jennifer Widom- "Database System Implementation"- Pearson Education- 2000.

4. Narang,"Database Management Systems", 2nd ed., PHI.

WEB REFERENCES

https://www.tutorialspoint.com/sql/sql-rdbms-concepts.htm http://www.rjspm.com/PDF/BCA-428%20Oracle.pdf http://kadakiaeducation.edu.in/Course/BCA/Course%20Material/RDBMS.pdf

COURSE OBJECTIVES

- To introduce programming with Applet and AWT.
- An overview of database access and details for managing information using the JDBC API.
- Examine the use of networking and collections.
- Learn how to program Servlet and JSP.
- To understand the web programming concepts in the perspective of Client and Server.

COURSE OUTCOMES

CO1 - Students are able to develop Applet Programming using various techniques

CO2 - Students are able to develop applications using Abstract Window Toolkit and Events

 $\mathbf{CO3}$ - Students are able to update and retrieve the data from the databases using JDBC-ODBC

CO4 - Students are able to develop server side programs in the form of Servlets

CO5 - Students are able to build up Java Applications using collections and JSP Tags.

UNIT -I: APPLETS AND GUI

Applet Fundamentals- Applet Class - Applet lifecycle- Steps for Developing Applet Programs- Passing Values through Parameters- Graphics in Applets; GUI Application - Dialog Boxes - Creating Windows - Layout Managers – AWT Component classes – Swing component classes- Borders – Event handling with AWT components - AWT Graphics classes - File Choosers - Color Choosers – Tree – Table – Tabled panels–Progressive bar - Sliders.

UNIT- II: JDBC AND JAVA NETWORKING

JDBC -Introduction - JDBC Architecture - JDBC Classes and Interfaces – Database Access with MySQL -Steps in Developing JDBC application - Creating a New Database and Table with JDBC - Working with Database Metadata; Java NetworkingBasics of Networking - Networking in Java- Socket Program using TCP/IP - Socket Program using UDP- URL and Inetaddressclasses.

UNIT- III: COLLECTIONS AND DESIGN PATTERNS

Collection Framework - ArrayList class - LinkedList class - ArrayListvs Linked List - ListIterator interface - HashSet class, LinkedHashSet class, TreeSet class PriorityQueue class - Map interface, HashMap class, LinkedHashMapclass, TreeMap class - Comparable interface , Comparator interface, Comparable vs Comparator; Design Patterns: Introduction to Design patterns - Catalogue for Design Pattern - Factory Method Pattern, Prototype Pattern, Singleton Pattern, Adapter Pattern, Proxy Pattern, Decorator Pattern, Command Pattern, Template Pattern, Mediator Pattern;

UNIT -IV: SERVLET AND JSP

Servlet: Advantages over Applets - Servlet Alternatives - Servlet Strengths - Servlet Architecture - Servlet Life Cycle - GenericServlet, HttpServlet - First Servlet - Invoking

Servlet - Passing Parameters to Servlets - Retrieving Parameters - Server-Side Include – Cookies; JSP : JSP Engines Working with JSP - JSP and Servlet - Anatomy of a JSP Page.

UNIT -V: WEB PROGRAMMING

Client-Side Programming: Client-side programming technologies - Form design using HTML, XHTML and DHTML and CSS - Client side validation Using JavaScript - Content Structuring using XML - Adding Interactivity with AJAX -JQuery Framework;

Server-side Programming: Web Servers - Handling request and response - Handling Form data - Session management - Database Access.

TEXT

1. S. Sagayaraj, R. Denis, P.Karthik& D. Gajalakshmi "Java Programming", Universities Press, 2018.

REFERENCES

- 1. Patrick Naughton& Herbert Schildt, "The Complete Reference: Java 2", Tata McGraw Hill, 1999.
- 2. Deitel&Deitel, "Java How to Program", Prentice Hall, 5th Edition, 2002
- 3. Peter Haggar, "Practical Java: Programming Language Guide", Addison-Wesley Pub Co, 1st Edition, 2000.
- 4. C.Muthu, "Programming with Java", McGraw Hill, Second Edition, 2008

WEB REFERENCES

http://math.hws.edu/javanotes/c6/index.html http://www.tutorialspoint.com/awt/ www.studytonight.com www.javatpoint.com www.learnjavaonline.org www.codingbat.com
COURSE OBJECTIVES

- To know the differences between desktop and web application.
- To construct classes, methods, and accessor and instantiate objects.
- To create and manipulate GUI components in C#.
- To code solutions and compile C# projects within the .NET framework.
- To build own desktop application with Database

COURSE OUTCOMES

CO1 - Students are able to know the differences between desktop application and web application.

CO2 - Students are able to construct classes, methods, and access modifier and instantiate objects.

CO3 - Students are able to create and manipulate GUI components in C# for windows application.

CO4 - Students are able to code solutions and compile C# projects within the .NET framework.

CO5 - Students are able to build the desktop application with Database.

UNIT - I: INTRODUCTION TO C#

Introduction to .NET – Features of C# - Data Types – Value Types – Reference Types - Variables and Constants – Declaring – Assigning values – variables of nullable types – Operators – Type Conversions – Implicit and Explicit Type Conversions – Arrays – Single Dimensional and Multidimensional – Control Flow Statements – Selection – Iteration and Jump – Classes and Objects – Access Modifiers – Defining a Class – Variables – Properties and Methods – Creating Objects – Inheritance – Polymorphism- Constructor and Destructors.

UNIT - II: WINDOWS FORMS

Windows Forms – Form Class – Common Operations on Forms – Creating a Message Box – Handling Events – Mouse Events – Keyboard Events – Common Controls in Windows Forms – Label – TextBox – Button – Combo Box – List Box – Check Box – Radio Button – Group Box – Picture Box – Timer – Open File Dialog – Save File Dialog – Font Dialog – Color Dialog – Print Dialog – Tree View – Menu.

UNIT - III: DELEGATES AND EVENTS

Delegates – Declaring a Delegate – Defining Delegate Methods – Creating and Invoking Delegate Objects – Multicasting with Delegates – Events – Event Sources – Event Handlers – Events and Delegates.

UNIT - IV: REFLECTION AND REMOTING

Life Cycle of threads-Using Reflection – Reflecting the Members of a Class - Dynamic Loading and Reflection - .NET Remoting – Architecture – Hosting of Objects – Single Ton and Single Call – Remoting Server – Remoting Client.

UNIT - V: DATABASE

Creating Connection String – Creating a Connection to a Database – Creating a Command Object – Working with Data Adapters – Using Data Reader to work with Databases – Using Dataset.

TEXT BOOKS

- 1. Vikas Gupta, "Comdex .NET Programming", Dream Tech Press, New Delhi, 2011
- 2. Kogent Solutions, "C# 2008 Programming Black Book", Dream Tech Press, New Delhi, Platinum Edition, 2009

REFERENCES

- 1. Rebecca M.Riordon, "Microsoft ADO .Net 2.0 Step by Step", Prentice Hall of India Private Limited, New Delhi, 2007
- 2. David S.Platt, "Introducing Microsoft .Net", Prentice Hall of India(Private) Limited, Third Edition, New Delhi, 2006

WEB REFERENCES

http://csharp.net-tutorials.com/index.php http://csharp.net-tutorials.com/classes/introduction/ http://www.homeandlearn.co.uk/csharp/csharp.html http://www.indiabix.com/c-sharp-programming/questions-and-answers/ https://www.wiziq.com/online-tests/43860-c-basic-quiz http://www.withoutbook.com/OnlineTestStart.php?quizId=71 http://www.compileonline.com/compile_csharp_online.php http://www.ideone.com

[SEMESTERI: PRACTICAL]

I: RELATIONAL DATABASE MANAGEMENT SYSTEM

- Creating database tables and using data types.
 Create table, Modify table, Drop table
- 2. Data Manipulation.
 Adding data with Insert, Modify data with Update, Deleting records with Delete
- 3. Implementing the Constraints.

• NULL and NOT NULL, • Primary Key and Foreign Key Constraint • Unique, Check and Default Constraint

- 4. Data Retrieval
 Simple select clause, Accessing specific data with Where, Ordered By, Distinct and Group By
- 5. Aggregate Functions.
 - AVG, COUNT, MAX, MIN, SUM, CUBE
- 6. String functions.
- 7. Date and Time Functions, Union, intersection and set difference.
- 8. Nested Queries & JOIN operation.
- 9. Practical Based on performing different operations on a view.
- 10. Practical Based on implementing use of triggers, cursors & procedures.

[SEMESTERI: PRACTICAL]

II: ENTERPRISE JAVA PROGRAMMING

- 1. Develop Applet Programming with various techniques.
- 2. Develop applications using AWT.
- 3. Working with Graphics ,Color and Font
- 4. Working with JDBC Classes(Database Operations- Create, Insert, Delete, Update, Select)
- 5. Handling ResultSet and Statements.
- 6. Jasper Report Generation
- 7. Working with Servlet and JDBC
- 8. Handling Client/Server Networking
- 9. Develop Java Server Pages applications using JSP Tags.
- 10. Working with Java Collections.

III: PROGRAMMING USING C#.NET

- 1. Variables, Constants and Arrays
- 2. Classes and Objects
- 3. Inheritance
- 4. Polymorphism
- 5. Windows Form Controls (Label, Text, Button, Check Box, Radio)
- 6. Windows Form Controls (List, Combo, Timer, Group Box, Picture Box)
- 7. Menu Handling
- 8. Reflection
- 9. ADO.NET Connection
- 10. Data Command

A. COMPUTER ORGANIZATION

COURSE OBJECTIVES

- To understand the basics of Computer Organization.
- To know about the functions of various languages and translation
- To know the relationship between computer instruction and the Machine code execution.
- To recognize the need of various types of computer organizations.
- To understand the influence of parallel and vector processing.

COURSE OUTCOMES

CO1 - Students are able to identify the types of instructions and the organization of registers and memory

CO2 - Students are able to describe the translation model of assembly language to machine language.

CO3 - Students are able to understand the micro-program by mapping the instructions.

CO4 - Students are able to recognize the types of computer organizations.

CO5 - Students are able to accept the better way of processing by Parallel and Vector processing.

UNIT – I: ORGANIZATION AND DESIGN

Instruction Codes - Computer Registers - Computer Instructions – Timing and Control – Instruction Cycle - Memory Reference Instructions – Input-Output and Interrupts.

UNIT – II: COMPUTER PROGRAMMING

Introduction - Machine language - Assembly language - The assembler - Program loops - Programming arithmetic and logical operation – Subroutines - Input-output programming.

UNIT – III: MICRO PROGRAM CONTROL

Control Memory – Address Sequencing – Micro program Examples – Design of Control Unit.

UNIT – IV: CENTRAL PROCESSOR UNIT

Introduction – General Register Organization – Stack Organization – Instruction Formats – Addressing Modes.

UNIT - V: PIPELINE AND VECTOR PROCESSING

Parallel Processing – Pipelining - Arithmetic pipeline - Instruction pipeline - Vector Processing - Array Processor.

TEXT

1. Morris Mano M. "Computer System Architecture". New Delhi: Prentice Hall of India Private Limited, 2011

REFERENCES

1. William Stallings. "Computer Organization and Architecture". 8th edition. Pearson Publication, 2010

2. Morris Mano. "Digital Login and Computer Design". New Delhi: Prentice Hall of India Private Limited, 2001.

WEB REFERENCES

www.computer-pdf.com/architecture/
www.tutorialspoint.com/computer_logical_organization
https://www.geeksforgeeks.org/computer-organization-and-architecture-tutorials/
https://www.javatpoint.com/computer-organization-and-architecture-tutorial
https://www.studytonight.com/computer-architecture/

B. PARALLEL COMPUTING

COURSE OBJECTIVES

- To learn the Kinds of parallelism, Parallel computer architectures (processor arrays, centralized memory multiprocessors, distributed memory multiprocessors, and multicomputers)
- To know and develop the Parallel algorithm design
- To identify the MPI library of message-passing functions
- To recognize the development of data-parallel programs and development of manager-worker programs with functional parallelism

COURSE OUTCOMES

CO1 - Students are able to compute speedup, efficiency, and scaled speedup of parallel computations, given appropriate data

CO2 - Students are able to apply Amdahl's Law to predict the maximum speedup achievable from a parallel version of a sequential program, given its execution profile

CO3 - Students are able to analyze the efficiency of a parallel algorithm

CO4 - Students are able to explain the relative advantages and disadvantages of mesh, hypercube, and butterfly networks with respect to diameter, bisection width, and number of edges/node

CO5 - Students are able to explain the advantages and disadvantages of constructing parallel computers using

UNIT - I: SCALABILITY AND CLUSTERING

Evolution of Computer Architecture – Dimensions of Scalability – Parallel Computer Models – Basic Concepts Of Clustering – Scalable Design Principles – Parallel Programming Overview – Processes, Tasks and Threads – Parallelism Issues – Interaction / Communication Issues – Semantic Issues In Parallel Programs.

UNIT - II: ENABLING TECHNOLOGIES

System Development Trends – Principles of Processor Design – Microprocessor Architecture Families – Hierarchical Memory Technology – Cache Coherence Protocols – Shared Memory Consistency – Distributed Cache Memory Architecture – Latency Tolerance Techniques – Multithreaded Latency Hiding.

UNIT – III: SYSTEM INTERCONNECTS

Basics of Interconnection Networks – Network Topologies and Properties – Buses, Crossbar and Multistage Switches, Software Multithreading – Synchronization Mechanisms.

UNIT – IV: PARALLEL PROGRAMMING

Paradigms And Programmability – Parallel Programming Models – Shared Memory Programming.

UNIT - V: MESSAGE PASSING PROGRAMMING

Message Passing Paradigm - Message Passing Interface - Parallel Virtual Machine.

1. Kai Hwang and Zhi.Wei Xu, "Scalable Parallel Computing", Tata McGraw-Hill, New Delhi,2003.

REFERENCES

 David E. Culler & Jaswinder Pal Singh, "Parallel Computing Architecture: A Hardware/Software Approach", Morgan Kaufman Publishers, 1999.
 Michael J. Quinn, "Parallel Programming in C with MPI & OpenMP", Tata McGraw-Hill, New Delhi, 2003.
 Kai Hwang, "Advanced Computer Architecture" Tata McGraw-Hill, New Delhi, 2003.

WEB REFERENCES

www.computing.llnl.gov/tutorials/parallel_comp/ www.geeksforgeeks.org/introduction-to-parallel-computing/ www.techopedia.com/definition/8777/parallel-computing

C. EMBEDED SYSTEM

COURSE OBJECTIVES

- To understand basic concepts in the embedded computing systems area;
- To determine the optimal composition and characteristics of an embedded system;
- To understand what is a microcontroller, microcomputer, embedded system
- To design and program an embedded system at the basic level;
- To develop hardware-software complex with the use of the National Instruments products.

COURSE OUTCOMES

CO1 - Students are able to understand basic concepts in the embedded computing systems area;

CO2 - Students are able to determine the optimal composition and characteristics of an embedded system;

CO3 - Students are able to understand what is a microcontroller, microcomputer, embedded system

CO4 - Students are able to design and program an embedded system at the basic level;

CO5 - Students are able to develop hardware-software complex with the use of the National Instruments products.

UNIT I: INTRODUCTION

Replacement for discrete logic-based circuits-Provide functional upgrades- Provide easy maintenance upgrades-Improves mechanical performance- Protection of intellectual property-Replacement for analogue circuits. Inside the embedded system-Processor-Memory-Peripherals-Software-Algorithms -Microcontroller-Expanded microcontroller-Microprocessor based-Board based.

UNIT II: EMBEDDED PROCESSORS

8 bit accumulator processors-Register models-8 bit data restrictions-Addressing memory-System integrity-Example 8 bit architectures-Z80-Z80 programming model-MC6800-Microcontrollers-MC68HC05-MC68HC11-Architecture-Data processors-Complex instructions, microcode and nanocode-INTEL 80286-Architecture-Interrupt facilities-Instruction set-80287 floating point support-Feature comparison. INTEL 80386DX-Architecture-Interrupt facilities-Instruction set-80387 floating point coprocessor-Feature comparison-INTEL 80486-Instruction set-Intel 486SX and overdrive processors-Intel Pentium-Multiple branch prediction-Data flow analysis-Speculative execution-The MMX instructions-The Pentium II- Motorola MC68000-The MC68000 hardware-Address bus-Data bus-Function codes-Interrupts-Error recovery and control signals.

UNIT III: MEMORY SYSTEMS

Memory technologies-DRAM technology - Video RAM - SRAM - Pseudo-static RAM -Battery backed-up SRAM - EPROM and OTP - Flash - EPROM - Memory organisation - By 1 organisation - By 4 organisation - By 8 and by 9 organisations - By 16 and greater organisations - Parity - Parity initialisation - Error detecting and correcting memory - Access times - Packages - Dual in line package - Zig-zag package - SIMM and DIMM - SIP -DRAM interfaces - The basic DRAM interface - Page mode operation - Page interleaving -Burst mode operation 87 EDO memory-DRAM refresh techniques - Distributed versus burst refresh - Software refresh - RAS only refresh - CAS before RAS (CBR) refresh - Hidden refresh - Memory management - Disadvantages of memory management - Segmentation and paging - Memory protection units - Cache memory - Cache size and organisation

UNIT IV: BASIC PERIPHERALS

Parallel ports-Multi-function I/O ports-Pull-up resistors-Timer/counters-Types-8253 timer modes-Interrupt on terminal count-Programmable one-shot -Rate generator-Square wave rate generator-Software triggered strobe-Hardware triggered strobe-Generating interrupts-MC68230 modes-Timer processors-Real-time clocks-Simulating a real-time clock in software-Serial ports-Serial peripheral interface-I2C bus-Read and write access-Addressing peripherals-Sending an address index-Timing.

UNIT V: REAL-TIME OPERATING SYSTEMS

What are operating systems?-Operating system internals-Multitasking operating systems-Context switching, task tables, and kernels-Time slice -Pre-emption-Co-operative multitasking-Scheduler algorithms-Rate monotonic- Deadline monotonic scheduling-Priority guidelines-Priority inversion-Disabling interrupts -Message queues-Waiting for a resource-VMEbus interrupt messages-Fairness systems-Tasks, threads and processes-Exceptions-Memory model-Memory allocation-Memory characteristics-Example memory maps-Memory management address translation-Bank switching-Segmentation-Virtual memory-Chossoing an operating system-Assembler versus high level language-ROMable code-Scheduling algorithms-Pre-emptive scheduling-Modular approach-Re-entrant code-Crossdevelopment platforms-Integrated networking-Multiprocessor support-Commercial operating systems-pSOS+ - pSOS+ kernel-pSOS+m multiprocessor kernel-pREPC+ runtime supportpHILE+ file system -pNA+ network manager-pROBE+ system level debugger-XRAY+ source level debugger-OS-9.

TEXT

1. Heath S. "Embedded Systems Design", Butterworth - Heinemann 1997.

REFERENCES

1. Kirk Zurell - "C Programming for Embedded Systems" R & D, Books - 2000

2. David. E, Simon, "An embedded software primer", Pearson Education Asia - Addison Wesley Longman (Singapore), Low Priced Edition, 2001, ISBN - 81 - 7808 - 045 - 1.

3. Michael Barr, "Programming Embedded Systems in C and C++", Shroff Publishers & Distributors Pvt.Ltd., Calcutta., March 2001, ISBN - 81 - 7366 - 076 - X.

WEB REFERENCES

www.entrancetutorials.com/embedded-systems-by-rajkamal-pdf/ www.internetofthingsagenda.techtarget.com/definition/embedded-system www.en.wikipedia.org/wiki/Embedded_system

[SEMESTERI: OPEN ELECTIVE]

[Hrs: 3/Credits: 3]

A. E-COMMERCE

COURSE OBJECTIVES

• To demonstrate an understanding of the foundations and importance of E-commerce

- To demonstrate an understanding of retailing in E-commerce by: analyzing branding and pricing strategies, using and determining the effectiveness of market research and assessing the effects of disintermediation.
- To analyze the impact of E-commerce on business models and strategy
- To describe Internet trading relationships including Business to Consumer, Businessto-Business, Intra-organizational.
- To describe the infrastructure for E-commerce
- To describe the key features of Internet, Intranets and Extranets and explain how they relate to each other.

COURSE OUTCOMES

CO1 - Students are able to demonstrate an understanding of the foundations and importance of E-commerce

CO2 - Students are able to demonstrate an understanding of retailing in E-commerce by: analyzing branding and pricing strategies, using and determining the effectiveness of market research and assessing the effects of disintermediation.

CO3 - Students are able to analyze the impact of E-commerce on business models and strategy

CO4 - Students are able to describe Internet trading relationships including Business to Consumer, Business-to-Business, Intra-organizational.

CO5 - Students are able to describe the infrastructure for E-commerce

Describe the key features of Internet, Intranets and Extranets and explain how they relate to each other.

UNIT – I: E-COMMERCE FUNDAMENTALS

Introduction - The e-commerce environment - The e-commerce marketplace - Focus on portals - Location of trading in the marketplace - Commercial arrangement for transactions -Focus on auctions - Business models for e-commerce - Revenue models - Focus on internet start-up companies - E-business infrastructure: Introduction on Internet - Internet standards - Focus on controls the internet - Managing e-business infrastructure - Focus on web service and service-oriented - Focus on new access devices.

UNIT – II: E-PROCUREMENT

Introduction - Drivers of e-procurement - Focus on estimating e-procurement cost savings -Risks and impacts of e-procurement - Implementing e-procurement - Focus on electronics B2B marketplaces - The future of e-procurement E-marketing: Introduction - E-marketing planning - Situation analysis - Objective setting – Strategy - Focus on characteristics of newmedia marketing communications – Tactics - Focus on online branding – Actions - Control.

UNIT – III: CUSTOMER RELATIONSHIP MANAGEMENT

Introduction:e-CRM-conversion marketing - the online buying process - customer acquisition management - focus on marketing communications for customer acquisition - customer retention management focus on excelling in e- commerce service quality - customer extension - Analysis and design: Introduction - process modeling - Data modeling - Design for e-business - Focus on user centered site design - Focus on security design for e-business.

UNIT – IV: M-COMMERCE

Introduction to m-commerce: Emerging applications - different players in m-commerce - mcommerce life cycle - Mobile financial services - mobile entertainment services - and

UNIT – V: MANAGEMENT OF MOBILE COMMERCE SERVICES

Content development and distribution to hand-held devices - content caching - pricing of mobile commerce services - The emerging issues in mobile commerce: The role of emerging wireless LANs and 3G/4G wireless networks - personalized content management - implementation challenges in m-commerce - futuristic m-commerce services.

TEXT

1. Dave Chaffey, "E-Business and E-Commerce Management", 3rd Edition, 2009, Pearson Education.

REFERENCES

- 1. Henry Chan, Raymod Lee and etl., "E-Commerce Fundamental and Applications", Wiley.
- 2. Brian Mennecke and Troy Strader, "Mobile Commerce: Technology, Theory".
- 3. Nansi Shi, "Mobile Commerce Applications", IGI Global, 2004.
- 4. Gary P. Schneider, "Electronic Commerce", 7th Edition, CENGAGE Learning India, New Delhi.
- 5. K.K. Balaji, D.Nag "E-Commerce", 2nd Edition, Mc Graw Hill Education, New Delhi.
- 6. P.T.Joseph," E-Commerce an Indian Perspective," PHI Publication, New Delhi.
- 7. Bhaskar Bharat, "Electronic Commerce Technology and Application", McGraw Hill.

WEB REFERENCES

www.feinternational.com/blog/what-is-e-commerce-an-introduction-to-the-industry/www.abetterlemonadestand.com/what-is-ecommerce/

[SEMESTERI: OPEN ELECTIVE]

[Hrs: 3/Credits: 3]

B. INTRODUCTION TO COMPUTER APPLICATION

COURSE OBJECTIVES

- To know about computer and basic applications of computer.
- To get knowledge about operating system
- To aim at imparting a basic level appreciation Programme

COURSE OUTCOME

- CO1 Students are able to know about computer and basic applications of computer.
- CO2 Students are able to get knowledge about operating system
- CO3 Students are able to aim at imparting a basic level appreciation Programme

UNIT I: KNOWING COMPUTER

What is Computer - Basic Applications of Computer - Components of Computer System -Central Processing Unit (CPU) – VDU - Keyboard and Mouse - Other input/output Devices -Computer Memory - Concepts of Hardware and Software - Concept of Computing - Data and Information; Applications of IECT - Connecting keyboard – mouse - monitor and printer to CPU and checking power supply.

UNIT II: OPERATING COMPUTER USING GUI BASED OPERATING SYSTEM

What is an Operating System - Basics of Popular Operating Systems - The User Interface -Using Mouse - Using right Button of the Mouse and Moving Icons on the screen - Use of Common Icons - Status Bar - Using Menu and Menu – selection - Running an Application -Viewing of File - Folders and Directories - Creating and Renaming of files and folders -Opening and closing of different Windows - Using help - Creating Short cuts - Basics of O.S Setup - Common utilities.

UNIT III: UNDERSTANDING WORD PROCESSING

Word Processing Basics - Opening and Closing of documents - Text creation and Manipulation - Formatting of text - Table handling - Spell check -language setting and thesaurus - Printing of word document.

UNIT IV: USING SPREAD SHEET

Basics of Spreadsheet - Manipulation of cells - Formulas and Functions - Editing of Spread Sheet - printing of Spread Sheet.

UNIT V: MAKING SMALL PRESENTATION

Basics of presentation software - Creating Presentation - Preparation and Presentation of Slides - Slide Show - Taking printouts of presentation / handouts.

TEXT

1. Introduction to Computer Applications, TNAU, Tamil Nadu.https://www.agrimoon.com/introduction-to-computer-applications-pdf-book/

WEB REFERENCES

https://homepage.cs.uri.edu/faculty/wolfe/book/Readings/Reading01.htm https://peda.net/kenya/ass/subjects2/computer-studies/form-1/itc2

C. PRINCIPLES OF INTERNET

COURSE OBJECTIVES

- To learn the basics of Internet.
- To provide fundamental knowledge in WWW.

COURSE OUTCOMES

- CO1 Students are able to learn the basics of Internet.
- CO2 Students are able to provide fundamental knowledge WWW.

UNIT-I: INTERNET

The wired world of the internet -Information travels across the internet -TCP/IP - Understanding internet addresses and domains <math>-Anatomy of web connections -Internet file types. Internet's Underlying Architecture: Domain name system -Routers -The internet's client/server architecture.

UNIT-II: CONNECTING TO THE INTERNET

Connecting your computer –Connecting to the internet from online services –ISDN –The internet/television connection –Network computers –DSL(Digital Subscriber Line). Communicating on the internet:E-mail–Usenet and newsgroups –Internet chat and instant messaging –Making phone calls on the internet.

UNIT-III: WORLD WIDE WEB

Webpages –Web browsers –Markup Languages –Hypertext –Image maps and interactive forms –Web host servers –Websites with databases. Common Internet Tools:Gophers –Telnet –FTP and downloading files –Searching the internet.

UNIT-IV: MULTIMEDIA ON THE INTERNET

Audio on the internet –Video on the internet –Intranet and shopping on the internet.

UNIT-V: SAFEGUARDING THE INTERNET

Firewalls-Viruses -Digital certificates.

TEXT

1. Preston Gralla, "How the Internet works", 10thEdition, Que publishers, 2014.

REFERENCES

- 1. Raj Kamal, "Internet and Web Technologies", Tata Mc Graw Hill, 2002.
- 2. C Xavier, "World Wide Web design with HTML", Tata Mc-Graw Hill, 2008.

WEB REFERENCES

www.informatics.buzdo.com/p912-internet-principles.htm

[SEMESTERII: CORE]

[Hrs: 5/Credits: 3]

ADVANCED ENTERPRISE JAVA PROGRAMMING

COURSE OBJECTIVES

- To expose the knowledge of MVC and Java server faces
- To provide the knowledge and skills required to develop web applications using the MVC framework provided by Apache Struts
- To Develop Enterprise web application using EJB.
- To understand and implement the object-relation mapping using Hibernate
- To explore the knowledge of Aspect Oriented Programming using Spring and Spring MVC.

COURSE OUTCOMES

CO1 - Students are able to work with JSP, JSF and Servlet using MVC approach.

CO2 - Students are able todevelop the web applications using the MVC framework provided by Apache Struts

CO3 - Students are able todevelop Enterprise web application using EJB.

CO4 - Students are able to implement the Object-Relation Mapping technique using Hibernate

 ${\bf CO5}$ - Students are able to gets knowledge of Aspect Oriented Programming using Spring and Spring MVC.

UNIT - I: INTEGRATING SERVLETS AND JSP, JAVA SERVER FACES

JSP: Basics – Life cycle of JSP- Static and dynamic content- javaBeans components; Understanding the need for MVC: implementing MVC with request dispatcher, summarizing the MVC code, interpreting relative URL, three data sharing approaches; JSF: Basics, Framework roles, Simple JSF application, Life Cycle of JSF page, using core tags, using HTML Component tags, localized messages, Standard Converters and Validators.

UNIT- II: STRUTS FRAMEWORK

Introduction to Struts, Understanding Struts, Struts Flow Control Six Basic steps in using Struts, FormBeans, Forms, Using properties files, Advanced Action, Manual Validation, validation in the Action, validation in the form bean, Struts Tiles, Motivations, Basics, Tiles definitions file.

UNIT - III: ENTERPRISE JAVA BEANS

EJB: Session Bean, Entity Bean, Message driven Bean, defining clients access with interfaces, life cycle of enterprise Bean, creation of Enterprise Bean, web client, other Enterprise Bean features, handling exceptions, Container- Managed Transactions, Bean Managed Transactions.

UNIT - IV: HIBERNATE

Basics- Enterprise Application architectures, Hibernate Motivation, Object Relation Mapping, Collection Mapping, Association Mapping, Collection and Association Relationships, Relationships in Java and Databases, Component Mapping, Inheritance Mapping, Life cycle of Hibernate Entities, Transactions, HQL, Native SQL, Querying Terminology, SQL Query Options, Querying With Hibernate.

UNIT - V: SPRING

Foundation: Motivation- Spring Hello World, Runtime environment, Dependency injection-Inversion of control ,Spring IoC container, Spring framework composition, Spring container instantiation, Spring bean definitions ,Bean naming, Bean scoping, Referencing other beans, Properties integration-Resource integration - Collection mapping, AOP with spring framework.

TEXTS

- 1. Marty Hall, Larry Brown., "Core Servlets and Java Server Pages", 2nd Edition, Pearson Education, 2004
- 2. Stephanie Bodoffetl., "The J2EETM Tutorial", Pearson Education, Second Edition, 2005
- 3. Hibernate Reference Documentation 3.3.1, Copyright © 2004 Red Hat Middleware, LLC available at http://www.hibernate.org/hib_docs/v3/reference/en/html_single/
- 4. Gary Mak, Josh Long and Daniel Rubio, "Spring Recipes: A Problem-Solution Approach", Apress Publications, Second Edition, 2010
- 5. Craig Walls, "Spring in action", Manning Publisher, Third Edition, 2011

REFERENCES

- 1. Cay S.Horstmann, Gary Cornell, "Core Java Volume I Fundamentals Core Concepts", Prentice Hall of India, Ninth Edition, 2012
- 2. Cay S.Horstmann, Gary Cornell, "Core Java Volume II Advanced Features", Prentice Hall of India, Ninth Edition, 2013
- 3. Minter Dave, Linwood Jeff, "Beginning Hibernate, From Novice to Professional", Apress, Second Edition, 2006
- 4. Doray, Arnold, "Beginning Apache, From Novice to Professional", Apress, Second Edition, 2006

WEB REFERENCES

http://courses.coreservlets.com/Course-Materials/struts.html http://www.roseindia.net/jsp/index.shtml http://www.oracle.com/technetwork/java/javaee/javaserverfaces-139869.html http://docs.oracle.com/javaee/1.4/tutorial/doc/JSFIntro.html http://docs.oracle.com/javaee/6/tutorial/doc/bnaph.html http://en.wikipedia.org/wiki/JavaServer_Faces

DESIGN AND ANALYSIS OF ALGORITHMS

COURSE OBJECTIVES

- To prove the correctness and analyze the running time of the basic algorithms for those classic problems.
- To understand the basic knowledge of algorithm design and its implementation.
- To learn the key techniques of Divide-and-Conquer and Greedy Method.
- To recognize the concept of Dynamic Programming and its algorithms
- To familiarize with Backtracking algorithms.
- To understand Branch and Bound techniques for designing and analyzing algorithms.

COURSE OUTCOMES

CO1 - Students are able to prove the correctness and analyze the running time of the basic algorithms for those classic problems.

 ${\bf CO2}$ - Students are able to understand the basic knowledge of algorithm design and its implementation.

CO3 - Students are able to learn the key techniques of Divide-and-Conquer and Greedy Method.

CO4 - Students are able torecognize the concept of Dynamic Programming and its algorithms **CO5** - Students are able to familiarize with Backtracking algorithms.

CO6 - Students are able to understand Branch and Bound techniques for designing and analyzing algorithms.

UNIT - I: INTRODUCTION

Algorithm Specification-Performance Analysis: Space complexity- Time Complexity-Asymptotic notations-practical complexities-performance measurement- Randomized algorithms: An informal Description- Identifying the repeated element- Primality testing-Advantages and Disadvantages.

UNIT - II: DIVIDE-AND-CONQUER AND GREEDY METHOD

Divide-and-conquer: General method-Binary Search-Finding the maximum and minimum-Merge sort- quick sort- Strassen's Matrix multiplication- The greedy Method: The general method-Knapsack problem-Minimum cost spanning tree

UNIT - III: DYNAMIC PROGRAMMING

Dynamic Programming: Dynamic programming- All pairs shortest paths- Single source shortest paths- String editing- 0/1 knapsack- The traveling salesperson problem-Flow shop scheduling

UNIT - IV: BACKTRACKING

Backtracking: General Method-8 queen's problem- Sum of subsets- Graph coloring-Hamiltonian cycles-Knapsack Problem

UNIT - V: BRANCH AND BOUND

Branch-and-Bound: General method of algebraic problem-Modular arithmetic- Comparison trees-Lower bound through reduction-Planar graph coloring problem-Bin packing.

TEXT

1. Ellis Horowitz, SartajSahni, SanguthevarRajasekaran, "Fundamentals of Computer Algorithms", Galgotia Publications Pvt.Ltd, 2005

REFERENCES

- 1. S.K.Basu, "Design Methods and Analysis of Algorithms", Fourth edition, 2010
- 2. A.V.Aho, J.E. Hopcroft and J.D.Ullman, "The Design and Analysis of Computer Algorithms", Pearson Education Asia, Addison-Wesley Publishing Company, 2003
- 3. AnanyLevitin, "Introduction to the Design and Analysis of Algorithm", Pearson Education Asia, Dorling Kindersley India Pvt.Ltd, 2003

WEB REFERENCES

http://www.personal.kent.edu/~rmuhamma/Algorithms/algorithm.html http://cs.uef.fi/pages/franti/asa/notes.html http://computerstuff7090.blogspot.in/2012/11/design-analysis-and-algorithm-video.html

COURSE OBJECTIVES

- To know the differences between desktop and web application.
- To construct classes, methods, and accessor and instantiate objects.
- To create and manipulate GUI components in C#.
- To code solutions and compile C# projects within the .NET framework.
- To build own desktop application with Database

COURSE OUTCOMES

CO1 - Students are able to know the differences between desktop application and web application.

CO2 - Students are able to construct classes, methods, and access modifier and instantiate objects.

CO3 - Students are able to create and manipulate GUI components in C# for windows application.

CO4 - Students are able to code solutions and compile C# projects within the .NET framework.

CO5 - Students are able to build the desktop application with Database.

UNIT- I: INTRODUCTION TO ASP.NET AND WEB FORMS

Developing ASP.NET Applications - ASP.NET File Types - The bin Directory - Application Updates - A Simple Application from Start to Finish-web.config file Web Form Fundamentals - A Simple Page Applet - The Problem With Response.Write - Server Controls - HTML Server Controls - ViewState - The HTML Control Classes - Events - Event Handling Changes - The Currency Converter application-Adding Support for Multiple Currencies - Adding Linked Images - Setting Styles – A Deeper Look at HTML control classes-HTML control events-The HTML control Base class-The HtmContainerControl Class-The HtmlInputControl Class-The Page class-The Controls collection-The HttpRequest Class-The HttpResponse Class-The ServerUtility Class-Assessing HTML Server controls

UNIT - II: WEB CONTROLS

Web Controls - Stepping Up to web Controls - Basic Web Control Classes - The web Control Tags - The WebControl Base Class - Units Enumerated Values - Colors - Fonts - List Controls - Table Controls - AutoPostBack and Web Control Events - How Postback Events Work - The Page Lifecycle - The Greeting Card Applet - Validation and rich Controls- The Calendar Control-Formatting the Calendar-restricting Dates- The AdRotator control-The Wizard control-Validation-The Validation Controls - The Validation Process-The Validator Class-A Simple Validation Example –Sever side example-Manual Validation-Understanding Regular Expressions-Literals and MetaCharacters-Finding a Regular expression- A Validated Customer Form Introduction – Creating a Simple Component – Properties and State – Database Components – Consuming the Database Component – Enhancing the Component with Error Handling – Aggregate Information – Data Objects.

UNIT - IV: CUSTOM CONTROLS

User Controls – Creating a Simple User Control – Visual Studio.NET Custom Control Support – Independent User Controls – Integrated User Controls – User Control Events – Limitations – Deriving Custom Controls.

UNIT - V: DATABASE ACCESS WITH COMMAND, ADAPTER AND XML

ADO.NET Data Access - About the ADO.NET Example - Obtaining the Sample Database -Simple Data Access - Simple Data Update - Importing the Namespaces - Creating a Connection - The Connection String SQL - Making the Connection - Defining the Select Command - Using a Command with a DataReader - Updating Data - Using Update - Insert and Delete Commands - Accessing Disconnected Data - Selecting Disconnected Data -Selecting Multiple Tables - Modifying Disconnected Data - Modifying and Deleting Rows -Adding Information - to a DataSet - Updating Disconnected Data - The Command Builder -Updating a DataTable - Controlling Updates - An Update Example – Using XML - XML's Hidden Role in .NET - XML Basics - Attributes - Comments - The XML Classes - the XML TextWriter - The XML Text Reader - Working with XML Documents - Reading an XML Document - Searching an XML Document - XML Validation – CreatingXML Schema -XSD Documents - Validating an XML File.

TEXTS

- 1. Mathew MacDonald, "ASP.NET: The Complete Reference", Tata McGraw Hill Publishing Company Ltd., New Delhi, 2006
- 2. Dino Eesposito, "Introducing Microsoft ASP.NET 2.0", AsokeK.Ghosh, Prentice Hall of India, Eastern Economy Edition, New Delhi, 2006

REFERENCE

 Stephen Walther,"ASP.NET 3.5 Unleashed", Pearson Education, Dorling Kindersley Pvt. Ltd, Second Edition, 2008

WEB REFERENCES

http://csharp.net-tutorials.com/index.php http://csharp.net-tutorials.com/classes/introduction/ http://www.homeandlearn.co.uk/csharp/csharp.html http://www.indiabix.com/c-sharp-programming/questions-and-answers/ https://www.wiziq.com/online-tests/43860-c-basic-quiz http://www.withoutbook.com/OnlineTestStart.php?quizId=71 http://www.compileonline.com/compile_csharp_online.php http://www.ideone.com

[SEMESTERII: PRACTICAL]

PRACTICAL IV: ADVANCED ENTERPRISE JAVE PROGRAMMING

- 1. JSP and MVC with Request Dispatcher
- 2. JSF in JSP Pages, Using all HTML and core render kit
- 3. Actions and Forms
- 4. Properties and Messages
- 5. Creating Web Client and Session Bean
- 6. Bean Managed Transactions and Container Managed Transaction
- 7. Object Relation Mapping and Collection Mapping
- 8. Association Mapping and Component Mapping
- 9. Inheritance Mapping
- 10. Spring Actions and Spring MVC

[SEMESTERII: PRACTICAL]

PRACTICAL V: DESIGN AND ANALYSIS OF ALGORITHMS

- 1. Divide and Conquer with Recursive Function
- 2. Divide and Conquer with Non-Recursive Function
- 3. Strassen's Matrix Multiplication
- 4. Greedy Method
- 5. Dynamic programming
- 6. Shortest path problem
- 7. Travelling sales person problem
- 8. Back tracking
- 9. Modular Arithmetic
- 10. Bin Packing

PRACTICAL VI: WEB APPLICATION USING C#.NET

- 1. Web Configuration File
- 2. Viewstate
- 3. HTML Control Classes, Control Events, Container and Input Control Classes,
- 4. Web Control Classes & Control Tags
- 5. Validation Controls
- 6. Rich Controls
- 7. Data Access
- 8. Components
- 9. Custom Controls
- 10. User Controls

A. HUMAN COMPUTER INTERACTION

COURSE OBJECTIVES

- To plan and Develop procedures and life cycle of Human Computer Interaction
- To analyze product usage through appropriate assessments and testing techniques.
- To apply the interface structure standards/rules for different users.
- To encourage communication between understudies of brain science, structure, and software engineering on UI improvement projects.
- To understand the intensity of HCI in the cutting edge world and the job it can play in advancing value, openness, and progress.

COURSE OUTCOMES

CO1 - Students are able to plan and Develop procedures and life cycle of Human Computer Interaction

CO2 - Students are able to analyze product usage through appropriate assessments and testing techniques.

CO3 - Students are able to apply the interface structure standards/rules for different users.

CO4 - Students are able to encourage communication between understudies of brain science, structure, and software engineering on UI improvement projects.

CO5 - Students are able to understand the intensity of HCI in the cutting edge world and the job it can play in advancing value, openness, and progress.

UNIT – I: HCI FOUNDATIONS

Input–output channels, Human memory, Thinking: reasoning and problem solving, Emotion, Individual differences, Psychology and the design of interactive systems, Text entry devices, Positioning, pointing and drawing, Display devices, Devices for virtual reality and 3D interaction, Physical controls, sensors and special devices, Paper: printing and scanning, Memory, Processing and networks: Design focus - The myth of the infinitely fast machine

UNIT – II: DESIGNING INTERACTION

Introduction, Models of Interaction, Framework and HCI, Ergonomics, Interaction Styles, Elements of WIMP Interfaces, Interactivity, Paradigms of Interaction, Interaction design basics, Process of design, User focus, Scenarios, Navigation design, Screen design and layout, Iteration and prototyping. Design Rules – Principles to support usability, Standards, Guidelines, Golden rules and heuristics, HCI Patterns

UNIT – III: EVALUATION TECHNIQUES

Evaluation, Goals of evaluation, Evaluation through expert analysis, Evaluation through user participation, Choosing and evaluation method. Universal design: Introduction, design principles, Multi-Modal Interaction – Designing websites for screen readers, Choosing the right kind of speech, Apple Newton, Designing for diversity. User Support – Requirements of User support, Approaches to user support, Adaptive help systems, designing user support systems.

UNIT – IV: MODELS AND THEORIES

Model Human Processor - Working Memory, Long-Term Memory, Processor Timing, Keyboard Level Model - Operators, Encoding Methods, Heuristics for M Operator Placement, What the Keyboard Level Model Does Not Model, Application of the Keyboard Level Model, GOMS - CMN-GOMS Analysis, Modeling Structure, State Transition Networks - Three-State Model, Glimpse Model, Physical Models, Fitts' Law. Guide Lines in HCI - Shneideman's eight golden rules, Norman's Sever principles, Norman's model of interaction, Nielsen's ten heuristics, Heuristic evaluation, contextual evaluation, and Cognitive walk-through.

UNIT – V: COLLABORATION AND COMMUNICATION MODELS

Face-to-face Communication, Conversation, Text-based Communication, Group working. Task Analysis: Introduction. Differences between task analysis and other techniques, Task decomposition, Knowledge based analysis, Entity relationship based techniques, Sources of information and data collection, Use of task analysis. Dialog design notations, Diagrammatic notations, Textual dialog notations, Dialog semantics, Dialog analysis and design.

TEXT

1. Dix, A., Dix, A. J., Finlay, J., Abowd, G. D., & Beale, R. "Human-computer interaction". Pearson Education, Haddington, 2003.

WEB REFERENCES

https://www.udacity.com/course/human-computer-interaction--ud400 https://www.edx.org/professional-certificate/gtx-human-computer-interaction https://www.tutorialspoint.com/human_computer_interface/index.htm

B. SOCIAL INFORMATION NETWORKS

COURSE OBJECTIVES

- To understand the real world applications
- To comprehend the elements of the social network
- To demonstrate and envision the social network
- To understand the role of web in the social network
- To apply the concept of social network in appropriate application

COURSE OUTCOMES

- CO1 Students are able to clear understanding of real world applications
- CO2 Students are able to comprehend the elements of the social network
- CO3 Students are able to demonstrate and envision the social network
- CO4 Students are able to understand the role of web in the social network
- CO5 Students are able to apply the concept of social network in appropriate application

UNIT-I: INTRODUCTION

Introduction to social network analysis – Fundamental concepts in network analysis – social network data – notations for social network data – Graphs and Matrices, Relations and attributes, Analysis of network data, Interpretation of network data.

UNIT-II: MEASURES & METRICS

Strategic network formation - network centrality measures: degree, betweenness, closeness, eigenvector - network centralization-density – eco-centric and socio-centric-reciprocity – transitivity – ego network – measures for ego network - dyadic network – triadic network - cliques - groups- clustering – search.

UNIT-III: COMMUNITY NETWORKS

Community structure - modularity, overlapping communities - detecting communities in social networks – discovering communities: methodology, applications - community measurement - evaluating communities – Applications, Models.

UNIT-IV: NETWORK DYNAMICS

Small world network - Watts-Strogatz networks - Statistical Models for Social Networks - Network evolution models: dynamical models, growing models - Nodal attribute model: exponential random graph models - Preferential attachment - Power Law - random network model: Erdos-Renyi and Barabasi- Albert-Epidemics - Hybrid models of Network Formation.

UNIT-V: THE WORLD WIDE WEB

Structure of the web - Modelling and aggregating social network data – developing social semantic application – evaluation of web-based social network extraction – Data Mining – Text Mining in social network – Tools – case study.

TEXT BOOK

1. Wasserman, S. and Faust, K. Social network analysis: Methods and applications, Vol. 8. Cambridge university press, 1994.

2. Newman, M. (2018). Networks. Oxford university press..

WEB REFERENCES

https://www.classcentral.com/course/sna-338 https://www.tutorialspoint.com/internet_technologies/social_networking.htm https://www.datacamp.com/community/tutorials/social-network-analysis-python

C. CLOUD COMPUTING

COURSE OBJECTIVES

- To introduce the broad perceptive of cloud architecture and model.
- To understand the concept of parallel and distributed computing
- To be familiar with the different technologies.
- To understand the features of virtualization.
- To learn to design the trusted cloud Computing system with different cloud platforms

COURSE OUTCOMES

CO1 - Students are able to understand the broad perceptive of cloud architecture and model.

- CO2 Students are able tounderstand the concept of parallel and distributed computing
- CO3 Students are able to understand the different technologies.
- CO4 Students are able tounderstand the features of virtualization.

CO5 - Students are able to learn to design the trusted cloud computing system with different cloud platforms

UNIT - I: INTRODUCTION

Cloud Computing at a Glance, The Vision of Cloud Computing, Defining a Cloud, Cloud Computing Reference Model, Characteristics and Benefits, Challenges Ahead, Historical Developments - Distributed Systems, Virtualization, Web 2.0, Service-Oriented Computing, Utility-Oriented Computing, Building Cloud Computing Environments - Application Development, Infrastructure and System Development, Computing Platforms and Technologies - Amazon Web Services (AWS), Google AppEngine, Microsoft Azure, Hadoop, Force.com and Salesforce.com

UNIT – II: PRINCIPLES OF PARALLEL AND DISTRIBUTED COMPUTING

Parallel vs. Distributed Computing , Elements of Parallel Computing - Hardware Architectures for Parallel Processing, Approaches to Parallel Programming, Levels of Parallelism, Laws of Caution, Elements of Distributed Computing - General Concepts and Definitions, Components of a Distributed System, Architectural Styles for Distributed Computing, Models for Inter-Process Communication, Technologies for Distributed Computing - Remote Procedure Call, Distributed Object Frameworks, Service Oriented Computing.

Virtualization - Introduction, Characteristics of Virtualized Environments, Taxonomy of Virtualization Techniques, Execution Virtualization, and Other Types of Virtualization, Virtualization and Cloud Computing, Pros and Cons of Virtualization, Technology Examples - Xen: Paravirtualization, VMware: Full Virtualization, Microsoft Hyper-V

UNIT - III: CLOUD COMPUTING ARCHITECTURE

Introduction, Cloud Reference Model - Architecture, Infrastructure / Hardware as a Service, Platform as a Service, Software as a Service, Types of Clouds - Public Clouds, Private Clouds, Hybrid Clouds, Community Clouds, Economics of the Cloud, Open Challenges -Cloud Definition, Cloud Interoperability and Standards, Scalability and Fault Tolerance, Security, Trust, and Privacy, Organizational Aspects. High-Throughput Computing: Task Programming - Task Computing, Characterizing a Task, Computing Categories, Frameworks for Task Computing, Task-based Application Models, Aneka Task-Based Programming.

UNIT - IV: ANEKA

Cloud Application Platform - Framework Overview, Anatomy of the Aneka Container -

From the Ground Up: Platform Abstraction Layer, Fabric Services, Foundation Services, Application Services, Building Aneka Clouds - Infrastructure Organization Logical Organization, Private Cloud Deployment Mode, Public Cloud Deployment Mode, Hybrid Cloud Deployment Mode, Cloud Programming and Management - Aneka SDK ,

Management Tools. Concurrent Computing: Thread Programming- Introducing Parallelism for Single Machine Computation, Programming Applications with Threads - Techniques for Parallel Computation with Threads, Multithreading with Aneka - Introducing the Thread Programming Model, Aneka Thread vs. Common Threads, Programming Applications with Aneka Threads - Aneka Threads Application Model, Domain Decomposition: Matrix MultiplicationFunctional Decomposition: Sine, Cosine, and Tangent.

UNIT - V: CLOUD PLATFORMS IN INDUSTRY

Amazon Web Services - Compute Services, Storage Services, Communication Services, Google AppEngine - Architecture and Core Concepts, Application Life-Cycle, Cost Model, Observations, Microsoft Azure - Azure Core Concepts - SQL Azure - Windows Azure Platform Appliance. Cloud Applications - Scientific Applications - Healthcare: ECG Analysis in the Cloud - Biology: Protein Structure Prediction - Biology: Gene Expression Data Analysis for Cancer Diagnosis - Geoscience: Satellite Image Processing, Business and Consumer Applications - CRM and ERP - Productivity - Social Networking - Media Applications - Multiplayer Online Gaming. Advanced Topics in Cloud Computing - Energy Efficiency in Clouds, Market Based Management of Clouds, Federated Clouds / InterCloud, Third Party Cloud Services

TEXT

1. Rajkumar Buyya, Christian Vecchiola, and S. Thamarai Selvi. Mastering cloud computing: foundations and applications programming. Tata McGraw Hill Education Private Limited, New Delhi, 2013

REFERENCES

- 1. Rittinghouse and Ransome, Cloud Computing: Implementation, Management, and Security, CRC Press, 2016.
- 2. Michael Miller "Cloud Computing Web based application that change the way you work and collaborate online". Pearson edition, 2008.
- 3. Kris Jamsa, Cloud Computing: SaaS, PaaS, IaaS, Virtualization, Business Models, Mobile, Security and More, Jones & Bartlett Learning, 2012.

WEB REFERENCES

https://www.ibm.com/cloud https://www.javatpoint.com/cloud-computing-tutorial

[SEMESTERII: OPEN ELECTIVE]

[Hrs: 3/Credits: 3]

A. PRINCIPLES OF WEB DESIGN

COURSE OBJECTIVES

• To provide a comprehensive overview of the largest Web Technologies, Hyper Text

Markup Languages (HTML) and Cascading Style Sheet (CSS).

• To learn through hands-on, practical instruction that will assist the students to tackle the real-world problems they face in building websites today—with a specific focus on HTML5 and CSS3.

COURSE OUTCOMES

CO1 - Students are able to learn how to combine basic HTML elements to create Web pages.

CO2 - Students are able to understand the use of HTML tags and tag attributes to control a Web page's appearance.

CO3 - Students are able to capable to learn how to add absolute URLs, relative URLs, and named anchors to Web pages.

CO4 - Students are able to gain a good understanding of using tables and frames as navigational aids on a Web site.

CO5 - Students are able to control appearance webpages by applying style sheet.

UNIT - I : HTML INTRODUCTION

Web page: Static & Dynamic Page - Web Browsers - HTML Editors - Tags – Elements – Attributes - HTML Page Structure - HTML Basic tags: Head – Title – Body. Basic text formatting: Heading tags – Paragraph tag – hr tag - Line break – Pre formatted. Presentational Element - Phrase Elements. List Tags: Ordered List – Unordered List – Definition List.

UNIT – II: LINKS, IMAGES AND TABLES

Link: Basic link – Directories and directory structure – creating links. Image and Object: Adding image to your site – Adding other objects – Using image as links.

Tables: Basic table elements and attributes – Advanced table – Accessibility issues with tables.

UNIT – III: FRAMES AND FORMS

Frames: The Frameset, No Frame Element - Creating Link between Frames - Nested Frameset. Form: Text Fields - Password Field - Radio Button – Checkbox - Submit Button – Reset Button – Button – Select – option – text area.

UNIT – IV: CASCADING STYLE SHEET-I

Introduction – syntax – ID selector - Class selector – External CSS – Internal CSS – Inline CSS – Font property: Font family - font size – font weight - font style - font variant - font stretch - font size adjust. Text Formatting: Color, text-align, vertical-align, decoration – indent- shadow –transform- letter spacing –word pacing- white space - direction. Text Pseudo Classes: First-letter pseudo class - First line pseudo class.

UNIT - V: CASCADING STYLE SHEET-II

Background: color – image – repeat – position – attachment. List: style type – style position – style image – marker offset. Table: table specific – border collapse – border spacing – caption side – empty cell – table layout. Outlines: outline width – outline style – outline color. The :focus and :active pseudo classes.

TEXT

1. Jon Ducktt. "Web Programming with HTML, CSS and JAVA SCRIPT", Wiley Publishing, 2005. Unit – I : Ch.1 Unit – II : Ch. 2, 3 & 4 Unit – III : Ch.5, 6 Unit – IV : Ch.7

Unit - V : Ch.8

REFERENCES

Joel Skylar. "Principles of Web Design". Singapore : Thomson Asia Pvt. Ltd 2000
 Powell , Thomas A. "Web Design – The Complete Reference", Tata McGraw Hill Edition 2000

3. Alexis Goldstein, Louis Lazaris, Estelle Weyl. "HTML5 & CSS3 for the Real World".

WEB REFERENCES

http://www.w3schools.com/css http://www.tutorialspoint.com/c**ss**

B. OPEN SOURCE APPLICATIONS

COURSE OBJECTIVES

- To understand the features of PHP
- To develop the different applications using PHP
- To demonstrate the applications using PHP with Mysql
- To understand the concepts of Perl
- To develop the applications using Perl

COURSE OUTCOMES

- CO1 Students are able to understand the features of PHP
- CO2 Students are able to develop the different applications using PHP
- CO3 Students are able to demonstrate the applications using PHP with Mysql
- CO4 Students are able to understand the concepts of Perl
- CO5 Students are able to develop the applications using Perl

Unit- I: BASIC PHP

Web Server-Apache-PHP-Data Types-User defined Variables-Constants-Operators-Control Structures-User defined Functions-Directory Functions-File system Functions-Arrays-String Functions-Date and Time Functions-Mathematical Functions-Miscellaneous Functions

UNIT - II: ADVANCED PHP WITH MYSQL

Exceptions handling-Error Handling Functions-Predefined Variables-Cookies-Sessions-COM-DOM- CURL-SOAP-Classes and Objects-Mail Function-URL Functions. PHP with MySQL: PHP MySQL Functions-Database driven application.

UNIT - III: ADVANCED PHP WITH AJAX, SEO AND CMS PHP WITH AJAX

Introducing Ajax-Ajax Basics-PHP and Ajax-Database Driven Ajax. PHP with SEO: Basic SEO-Provocative SE Friendly URLs-Duplicate Content- CMS: Wordpress Creating an SE-Friendly Blog.

UNIT - IV: BASIC PERL

Introduction-Scalar Data- Lists and Arrays-Subroutines-Input and Output- Hashes-Regular Expressions-Control Structures-Perl Modules-File Tests

UNIT 5: ADVANCED PERL

Directory Operations-Strings and Sorting-Smart Matching-Process Management- Advanced Perl Techniques

TEXTS

Unit 1 & 2 :

Mehdi Achour, Friedhelm, Betz Antony Dovgal, Nuno Lopes, Hannes Magnusson, Georg Richter, Damien Seguy, Jakub Vrana And several others, "PHP Manual (Download the manual from PHP official website www.php.net)", 1997-2011 the PHP Documentation Group.

Unit 3 :

Lee Babin, "Beginning Ajax with PHP From Novice to Professional", Apress, 2007

Randal L. Schwartz, Tom Phoenix, brian d foy, "Learning Perl, Fifth Edition Making Easy Things Easy and Hard Things Possible", O'Reilly Media, June 2008

REFERENCES

Steven D. Nowicki, Alec Cove, Heow Eide-goodman ,"Professional PHP", Wrox Press, 2004.

WEB REFERENCES

www.php.net www.phpclasses.org

[SEMESTERII: OPEN ELECTIVE]

C. PROBLEM SOLVING TECHNIQUES

COURSE OBJECTIVES

- To develop problem solving skills with top down design principles.
- To become competent in algorithm design and program implementation.
- To develop skills to apply appropriate standard methods in problem solving

COURSE OUTCOMES

CO1 - Students are able to develop programming techniques required to solve a given problem.

- CO2 Students are able to develop problem solving skill using top down design principles.
- CO3 Students are able to design an algorithm for a problem.
- CO4 Students are able to develop techniques to handle array structure

CO5 - Students are able to develop techniques such as searching and sorting

UNIT - I: PROGRAMMING TECHNIQUES

Steps Involved in Computer Programming – Problem Definition – Outlining The Solution – Flow Chart – Developing Algorithms – Efficiency of Algorithms - Analysis of Algorithms.

UNIT – II: FUNDAMENTAL ALGORITHMS

Exchanging the Values – Counting – Summation of Set of Number – Factorial Computation – Sine Computation – Fibonacci Sequence – Reversing the Digits of an Integer – Base Conversion – Character to Number Conversion.

UNIT – III: FACTORING METHODS

Finding the Square Root of a Number – Smallest Divisor of an Integer – GCD of Two Integers – Generating Prime Numbers – Computing the Prime Factors of an Integer – Generation of Pseudo-Random Numbers – Raising a Number to a Large Power – Computing the Nth Fibonacci Number.

UNIT – IV: ARRAY TECHNIQUES

Array Order Reversal – Array Counting Or Histogramming – Finding the Maximum Number in a Set – Removal of Duplicates from an Ordered Array – Partitioning an Array – Finding The kth Smallest Element – Longest Monotone Subsequence.

UNIT - V: MERGING, SORTING AND SEARCHING

Two Way Merge - Sorting by Selection, Exchange, Insertion, Partitioning - Binary Search – Hash Searching.

TEXT

1. Dromey R G, "How to Solve it by Computer", Prentice Hall of India, 1997

REFERENCES

 Michael Schneider, Steven W. Weingart, David M. Perlman, "An Introduction to Programming and Problem Solving with Pascal", Wiley Eastern Limited, New Delhi, 1982.
 Harold Abelson and Gerald Sussman with Julie Sussman, "Structure and Interpretation of Computer Programs", MIT Press, 1985.

WEB REFERENCES

http://nptel.ac.in/courses/106104074/ http://javahungry.blogspot.com/2014/06/algorithm-problem-solving-techniques-or-approaches-forsoftware-programmer.html

ANNAMALAI UNIVERSITY M.Sc. INFORMATION TECHNOLOGY SYLLABUS (2021 – 2022)

The Course of Study and the Scheme of Examination

Sl.	Study Components Course Title		ins.	Cuadit	Tido of the Dance	Maximum Marks				
No.			nrs / week	Creatt	Title of the Paper	CLA	Uni.	Total		
SEMESTER I							Exam			
1		Paper 1	5 3		Operating System	25	75	100		
2		Paper 2	5	3	Object Oriented Analysis & Design	25	75	100		
3	Core	Paper 3	5	3	DBMS	25	75	100		
	Practical		3	-	Object Oriented Programming Lab	0	-	-		
			3	-	RDBMS-Lab	0	-	-		
		3 - Visual Program		Visual Programming-Lab	0	-	-			
Internal Elective for same major students (Choose any one)										
4	Core Elective	Paper-1	3	3	A. Computer ArchitectureB. Discrete MathematicsC. Principles of Communication System	25	75	100		
	E	xternal Elec	ctive for o	other maj	or students (Inter/multi disciplinary papers)					
5	Open Elective	Paper-1	3	3	Digital data handling	25	75	100		
			30	15		125	375	500		
SEMESTER II						CIA	Uni. Exam	Total		
6	Paper 4 4 3		Visual Programming	25	75	100				
7		Paper 5	4	3	Computer Networks	25	75	100		
8	Core	Paper 6	4	3	Software Engineering	25	75	100		
9	Practical	Paper 1	3	4	Object Oriented Programming Lab	25	75	100		
10	Paper 2		3	4	RDBMS- Lab	25	75	100		
11		Paper 3	3	4	Visual Programming -Lab	25	75	100		
		Intern	nal Electi	ve for sar	ne major students (Choose any one)					
	Core Elective	Paper-2	4	3	A. Introduction to Computation with PYTHON		75	100		
12					B. E-Commerce	25				
					C. Microprocessor & Micro Controller					
External Elective for other major students (Inter/multi disciplinary papers)										

13	Open Elective	Paper-1	3	3	HTML Programming	25	75	100
14	*Field Study		-	2		100	-	100
15	Compulsory Paper		2	2	Human Rights	25	75	100
			30	31		325	675	1000

* Field Study

There will be field study which is compulsory in the first semester of all PG courses with 2 credits. This field study should be related to the subject concerned with social impact. Field and Topic should be registered by the students in the first semester of their study along with the name of a mentor before the end of the month of August. The report with problem identification and proposed solution should be written in not less than 25 pages in a standard format and it should be submitted at the end of second semester. The period for undergoing the field study is 30 hours beyond the instructional hours of the respective programme. Students shall consult their mentors within campus and experts outside the campus for selecting the field and topic of the field study. The following members may be nominated for confirming the topic and evaluating the field study report.

(i). Head of the respective department

(ii). Mentor

(iii). One faculty from other department

ANNAMALAI UNIVERSITY

MASTER OF SCIENCE

M.Sc. INFORMATION TECHNOLOGY

SYLLABUS UNDER CBCS (2021-2022)

SEMESTER I

CORE PAPER 1

OPERATING SYSTEM

Objectives:

To learn what an operating system is, what its role in a computing system is, how operating systems have evolved over time, and what the various components of an operating system are and how they work. Several real operating system case studies help to understand how the principles studied are used in practice. The role of an operating system in a distributed system is also to be studied.

UNIT-I

Introduction: Main frame Systems, Desktop Systems - Multiprocessor Systems - Distributed Systems - Clustered Systems - Real Time systems - Hand held Systems, Operating Systems Structures: System Components - Operating System Services - System calls - System Programs - System Design and Implementation - CPU scheduling: Basic Concepts - Scheduling Algorithms.

UNIT-II

Process Management: Process Concepts - Process Scheduling - Operation on Process - Co-Operating process - Inter Process Communication - Threads: Multithreading Models - Process Synchronization: The Critical Section Problem - Synchronization Hardware - Semaphores - classical problem of Synchronization -Monitors - Deadlock: Deadlock Characterization - Methods for handling Deadlocks - Deadlock Prevention -Deadlock Avoidance - Deadlock Detection - Recovery from Deadlock.

UNIT-III

Memory Management: Background - Swapping - Contiguous Memory Allocation - Paging - Segmentation - Segmentation with paging - Virtual Memory: Demand paging - Page Replacement - Thrashing.

UNIT-IV

File Systems: File Concepts - Access methods - Directory Structure - File Protection - File System Implementation: File System Structure and Implementation - Directory Implementation - Allocation methods Free Space Management - Recovery - Disk Structure - Disk Scheduling.

UNIT-V

Distributed Operating System : Design issues in distributed operating system -Distributed file systems -Naming and Transparency-Remote File Access -Stateful versus Stateless service - Distributed Coordination-Event Ordering -Mutual Exclusion - Atomicity - Concurrency Control - Deadlock Handling -Election Algorithms-Case Study-Linux and Windows.

Text Books:

Silberschatz, Galvin, Gagne, Operating System Concepts, 6th Edition, 2003.

Pradeep K.Sinha, Distributed OS concepts and Design, IEEE computer Society Press, PHI 1998.

References Books:

Dhamdhere - Operating System a Concept Based Approach, 2nd Edition, 2006, TMH, New Delhi.

Harris - Schaums Outlines of Operating Systems, 2005, TMH, New Delhi.

Andrew S. Tanenbaum, Modern Operating Systems, Prentice Hall of India, 2nd Edition 2001.

Achut S. Godbole and Kahate Atul, Operating Systems & Systems Programming, Tata Mcgraw Hill, 2003.

Charles Crowley, Operating systems: A Design Oriented Approach, Tata McGraw Hill, 1999.

SEMESTER I

CORE PAPER 2

OBJECT ORIENTED ANALYSIS AND DESIGN

UNIT I: Object oriented concepts and principles – Object oriented concepts – Identifying the elements of an object model – Management of object oriented software projects –Object oriented Analysis – OOA Process – Object relationship model – Object behavior model.

UNIT II : Object oriented Design- design for object oriented systems – the system design process – object design process – design patterns – Object oriented programming.

UNIT III: Object oriented Testing – Testing OOA and OOD models – Testing strategies – Test case design for OO software – Testing methods – Interclass test case design

UNIT IV : Technical Metrics for Object oriented system – Object oriented metrics – Metrics for OOD – Class oriented metrics - System concept for Object modeling - Abstraction, Inheritance, Polymorphism, Encapsulation, Message Sending, Association, Aggregation.

UNIT V: Use-Case Modeling – Actors, Use Cases, Use Case Relationships. The Process of Requirements Use-Case - Identify Business Actors, Identify Business Requirements Use Cases, Construct Use Case Model Diagram-Class Diagrams and Object Diagrams-Package Diagrams-Sequence and Collaboration diagrams, State chart diagram.

TEXT BOOKS

- 1. Roger Pressman, Software Engineering, 6th Edition, TMH, 2010.
- 2. Bahrami, Object Oriented Systems Development , 7th Edition, TMH ,1999.

REFERENCE BOOKS

- 1. Stephan R. Schach, *—Object oriented software*
- 2. Timothy C. Lethbridge, Robert Laganiere, |Object-Oriented Software Engineering –
- **3.** A practical software development using UML and Java^{II}, 2nd Edition, TMH, 2008.

E-R EFERENCES

http://www.freetechbooks.com/object-oriented-analysis-and-design-course- notes-t577.html www.engin.umd.umich.edu/CIS/course.des/cis200/.../tutorial/one.doc

SEMESTER I

CORE PAPER 3

DATA BASE MANAGEMENT SYSTEM

Objectives:

The primary goal of this subject is to provide the complete knowledge on the object-oriented approach of databases. This serves the skill on Functional Dependencies, Normalization and data base design. It provides the complete set of administration tools on databases.

UNIT-I

Concepts For Object-Oriented Databases : Object Identity, Object Structure, and Type Constructors -Encapsulation of Operations, Methods, and Persistence - Type Hierarchies and Inheritance - Complex Objects - Other Object-Oriented Concepts - Object Databases Standards, Languages and Design - Overview of Object Model of ODMG - The Object Definition Language - The Object Query Language - Overview of C++ Language Binding - Object Database Conceptual Design - Overview of the CORBA standard for Distributed Objects - Object Relational and Extended Relational Database Systems: Evolution and Current Trends of Database Technology - The Informix Universal Server - Object Relational Features of Oracle 8 - An overview of SQL 3 - Implementation - Related Issues for Extended Type Systems - The Nested Relational Data Model.

UNIT-II

Functional Dependencies and Normalization for Relational Database: Informal Design Guidelines for Relational Schemas - Functional Dependencies - Normal Forms Based on Primary Keys - General Definitions of Second and Third Normal Forms - Boyce-Codd Normal Form - Relational Database Design and further Dependencies: Algorithms for Relational Database schema Design – Multi-valued Dependencies and Fourth Normal Form - Join Dependencies and Fifth Normal Form - Inclusion Dependencies - Other Dependencies and Normal Forms - Practical Database Design and Tuning: The Role of Information Systems in Organizations - The Database Design Process - Physical Database Design in Relational Databases - An Overview of Database Tuning in Relational Systems - Automated Design Tools.

UNIT-III

Database System Architecture and The System Catalog: System Architectures For DBMS - Catalogs for Relational DBMS - System Catalog Information in Oracle - Other Catalog Information Accesses by DBMS software Modules - Data Dictionary and Data Repository Systems - Query Processing and Optimization: Translating SQL Queries into Relational Algebra - Basic Algorithms for Executing Query Operations - Using Heuristics in Query Optimization - Using Selectivity and Cost Estimates in Query Optimization - Query Optimization in Oracle - Semantic Query Optimization - Transaction Processing Concepts - Transaction and System Concepts - Desirable Properties of Transactions - Schedules and Recoverability - Serializability of Schedules - Transaction Support in SQL.

UNIT-IV

Concurrency Control Techniques: Locking Techniques for Concurrency Control - Concurrency Control Based on Timestamp Ordering - Multiversion Concurrency Control Techniques - Validation Concurrency

Control Techniques - Granularity of Data Items and Multiple Granularity Locking - Using Locks for Concurrency Control in Indexes - Some other Concurrency Control Issues - Database Recovery Techniques: Recovery Concepts - Recovery Techniques Based On Deferred Update - Recovery Techniques Based on Immediate Update - Shadow Paging - The ARIES Recovery Algorithms - Recovery In Multi-database Systems - Database Backup and Recovery From Catastrophic Failures - Database Security and Authorization: Database Security Issues - Discretionary Access Control Based on Granting/Revoking of Privileges -Mandatory Access Control for Multilevel Security - Statistical Database Security.

UNIT-V

Enhanced Data Models for Advanced Applications - Active Database Concepts - Temporal Database Concepts - Spatial and Multimedia Database - Distributed Databases and Client - Server Architecture - Distributed Database Concepts - Data Fragmentation, Replication and Allocation Techniques for Distributed Database Design - Types of Distributed Database Systems - Query Processing in Distributed Databases - Overview of Concurrency Control and Recovery in Distributed Databases - An overview of Client - Server Architecture and its Relationship to distributed Databases - Distributed Databases in Oracle-Future Prospects of Client-Server Technology - Deductive Databases - Introduction to Deductive Databases - Prolog/Datalog Notation - Interpretation of Rules .

Basic interface Mechanisms for Logic Programs - Datalog - Programs and their Evaluation - Deductive Database Systems - Deductive Object - Oriented Databases - Applications of Commercial Deductive Database Systems.

Text Books:

Ramez Elmasri, Shamkant B. Navathe, "Fundamentals of Database Systems", Addison - Wesley, 2000.

References Books:

Raghu Ramakrishnan, Johannes Gehrtee, "Database Management System", Tata McGraw Hill, 2002.

Henry F.Korth & Abraham Silberschatz, "Database System Concepts", McGraw, 1997.

Jeffrey D.Ullman, "Principles of Database Systems", Galgotia Publishers, 1998.

CORE PRACTICAL – I

OBJECT ORIENTED PROGRAMMING LAB

Objectives:

The main aim is to familiarize the concepts learned in Object Oriented Programming. To write Programs for various object oriented concepts using C++ and Java.

Programs to implement

Function overloading in C++

Simple class design and objects creations in C++

Constructor and destructor in C++

Operator overloading, friend functions

Overloading assignment operator, type conversions

Inheritance and polymorphism in C++

Input/Output operation

Simple class design and objects creation in Java

String handling in Java

Control Structures in Java

Exceptions handling in Java

Java I/O

Multi-threaded programs in Java

Connecting to Database and accessing databases

CORE PRACTICAL – II RDBMS LAB

Objectives:

To familiarize the concepts learned in RDBMS and to develop various practical applications using SQL and PL/SQL.

Excercises

Study of various SQL commands Implementation of the concept of Normalization Inventory control system with a reorder level Student Mark sheet processing Pay roll processing Electricity bill preparation Telephone Directory Maintenance Bank Transactions Library Information processing Personal Information system

VISUAL PROGRAMMING LAB

Objectives:

The students will acquire knowledge on software development using the visual programming languages. This course concentrates on the development of software systems in Visual Basic and Visual C++.

Visual Basic

Write a VB project that receives a year number from a text box and month name from list box and displays number of days in the given month. Take care of leap years. Use Lost Focus event for list box.

Write a VB project that stores 10 employee records with fields EMPNO, NAME, AGE, SEX and SALARY, in an array. Display data fields in text boxes and provide command buttons to move to desired record.

Write a VB project that receives a foreign currency value selected from a list box and converts it into equivalent Indian rupees. (e.g. USD 42.45, Sterling 71.30, D.Mark 25.52, SW Franc 31.58, SaudiRiyal 11.40, French Franc 7.60, UAE Dhiram 11.55, Kuwait Dhinar 140.56)

[[

Write a VB project using control array that creates a scientific calculator with appropriate command buttons. Include the following capabilities for the calculator: +, -, *, /, %, power, square root, square and log (base 10).

Write a VB project to create a screen saver that displays a list of pictures with 1 second pause in between succesive pictures.

Write a VB project for commercial bank operations using SB account database, with the following features:

1. ADD NEW ACCOUNT

2. DEPOSIT AMOUNT

3. WITHDRAW AMOUNT (with minimum balance condition)

4. Calculate simple interest and update balance taking average of last 6 month balance in the account.

5. CLOSE ACCOUNT.

Write a VB project using built in Ax control (Rich Text Box), develop the windows NOTEPAD like editor with File and Edit menus and also display the floating menu whenever necessary.

Write a VB project for a Blood Bank that maintains a list of donors with address and their blood group. Provide the following reporting features:

i) Search and display the address of a particular donor, given the name in a text box.

ii) Display all the donors (using data report)

a) in age group 20-30.

b) in particular city.

c) with particular blood group.

d) male donors with particular blood group

e) female donors with particular blood group.

Write a VB project using Ax DLL or EXE add a class module that would perform the following functions:

a) Test whether the given number is perfect or not

b) Whether the gn% number Armstrong or not

c) Find the factorial of the given number

d) sum of digits

Write a VB project using Activex X control to create a Textbox that accepts only numeric value. Provide the following properties for the text box: BackColor, Forecolor and Text.

Visual C++

Write Visual C++ win32 application program using MFC that creates a new font.

Write Visual C++ win32 application program using MFC that displays a message "Hello Good Morning!" wherever the user clicks the mouse button on the client area.

Write Visual C++ win32 application program using MFC that allows the user to draw pictures with the help of mouse as a free hand drawing tool.

Write Visual C++ win32 application program using MFC that creates a list box and displays name of the states in India.

Write Visual C++ win32 application program using MFC that displays line, rectangle, rounded rectangle, ellipse and polygon filled with colors.

Write Visual C^{++} win32 application program using MFC that fills the background of the client area with a bitmap.

Write Visual C++ win32 application program using MFC that displays a menu. Choose the menu items using keyboard accelerator keys and display appropriate messages for the selected command, in message box.

Write Visual C++ win32 application program using MFC that displays the status of ALT, CTRL, SHIFT, NUM LOCK and SCROLL LOCK keys.

Write Visual C++ win32 application program using MFC that displays current mouse coordinates in status bar.

Write Visual C++ win32 application program using MFC that creates two push buttons OK and CANCEL on the client area. Buttons should respond to user click over them and display appropriate message

SEMESTER I CORE ELECTIVE PAPER 1

(to choose 1 out of 3)

A. COMPUTER ARCHITECTURE

Objectives:

To understand the main components of a computer system and the considerations in their design. To understand performance measures, as well as their impact on system architecture. To Understand the interplay among system components such as design trade-offs.

UNIT-I

Basic structure of computer hardware and software - Addressing methods and machine program sequencing - Computer arithmetic - logic design for fast adders - multiplication - Booth's algorithm - Fast multiplication - integer division - floating point number representation- floating point arithmetic.

UNIT-II

Control unit - instruction execution cycle - sequencing of control signals - hardwired control - PLAs - micro programmed control - control signals - microinstructions - micro program sequencing - Branch address modification - Prefetching of micro instructions - emulation - Bit slices.

UNIT-III

Memory organization-Semiconductor RAM memories- internal organization-Bipolar and MOS devices -Dynamic memories - multiple memory modules and interleaving - cache memories - mapping functions replacement algorithms - virtual memory - address translations - page tables memory management units -Secondary memory - disk drives - organization and operations - different standards.

UNIT-IV

Input-output organizations - accessing I/ O devices - direct memory access (DMA) - interrupts - interrupt handling - handling multiple devices - device identification - vectored interrupts - interrupt nesting - Daisy chaining - I/ O interfaces - serial and parallel standards - buses - scheduling - bus arbitration - bus standards.

UNIT-V

Introduction to parallel organizations - multiple processor organization - symmetric multiprocessors - cache coherence - non uniform memory access - vector computation - introduction to CISC and RISC - Architectures - Comparison.

Text Books:

Hamacher C V, Computer Organization, 4th Edition, McGraw Hill, 1997. Stallings William, Computer Organization and Architecture, 6th Edition, Pearson Education, 2003

References Books:

Pal Chaudhary P, Computer Organization and Design, Prentice Hall of India, 2004. Hayes J P, Computer Organization and Architecture, 2nd Edition, Mc Graw Hill, 1998. Tanenbaum A S, Structured Computer Organization, 6th Edition, Prentice Hall, 2006. Kai Hwang and Faye A Briggs, Computer Architecture and Parallel Processing, Mc.Graw Hill, 1985.

B. DISCRETE MATHEMATICS

Objectives:

To understand the concepts of sets, proposition, permutation and combinations. To familiarize in relations, digraphs and functions, trees, groups and coding. To help the students for developing the fundamental mathematical knowledge. **UNIT-I**

Fundamentals: Sets and subsets - Operations on Sets - Sequences - Division in the integers - Matrices - Mathematical structures.

Logic: Propositions and Logical operations - Conditional Statements - Methods of Proof - Mathematical Induction.

Counting: Permutations - Combinations - The Pigeonhole Principle - Elements of Probability - Recurrence Relations.

UNIT-II

Relations and Digraphs: Product Sets and Partitions - Relations and Digraphs - Paths in relations and Digraphs - Properties of relations - Equivalence Relations - Computer Representation of relations and Digraphs - Manipulation of Relations - Transitive Closure and Warshall's Algorithm.

UNIT-III

Functions: Functions - Permutation Functions - Growth of Functions Topics in Graph Theory: Graphs - Euler Paths and Circuits - Hamiltonian Paths and Circuits - Coloring Graphs

UNIT-IV

Order Relations and Structures: Partially Ordered Sets - External Elements of Partially Ordered Sets - Lattices - Finite Boolean Algebras - Functions on Boolean Algebras - Boolean Functions as Boolean Polynomials. Trees: Trees - Labeled trees - Tree Searching - Undirected Trees - Minimal Spanning Trees.

UNIT-V

Semigroups and Groups: Binary Operations Revisited - semigroups - Products and Quotients of Semigroups - Groups - Products and Quotients of Groups. Groups and coding: Coding of Binary Information and Error Detection - Decoding and Error Correction

Text Books

Bernard Kolman.Robert C.Busby and Sharon Ross, "Discrete Mathematical Structures", Prentice Hall of India Pvt. Ltd., 1997.

References Books: Lipschutz - Schaums Outline Series, "Discrete mathematics ", Special Indian Edition 2nd,

2006, TMH, New Delhi.

Veerarjan, "Discrete mathematics ", 1st Edition, 2006, TMH, New Delhi.

Trembley J.P. and Manohar R.P., "DISCRETE MATHEMATICAL STRUCTURES WITH APPLICATIONS

TO COMPUTER SCIENCE", TataMcGraw - Hill, 1975

Korthage R.R., "DISCRETE COMPUTIONAL STRUCTURES", Academic Press, 1974.

Preparata, F.P., Yeh R.T., "INTRODUCTION TO DISCRETE STRUCTURES", Addison - Wesley, 1973.

C. PRINCIPLES OF COMMUNICATION SYSTEM

Objectives:

The aim of this course is to introduce the principles of communications, digital communications, and data communications.

UNIT-I

Spectral Analysis and Random Variable Process: Spectral characteristics of a periodic signal - Spectra of common signals related to communication - Cross correlation, auto correlation and power/energy density spectra - random signals and process - Modeling noises.

UNIT-II

Analog Modulation Systems: Basic principles of AM, FM, and PM - Spectra, power consideration, receiver's characteristics and deduction of AM, FM and PM systems performance - Threshold effects reduction.

UNIT-III

Base Band Data Communication: Sampling and quantizing - PCM, ADPCM, DM, ADM - Base band pulse shaping - Binary data formats - Base band transmission - ISI, correlative coding, optimum SNR - Matched filter deduction.

UNIT-IV

Digital Modulation: Digital modulation - Coherent binary modulation techniques - Coherent quadrature modulation techniques - Non-coherent binary modulation - M-array modulations - Performance of digital modulation systems based on probability of error, bandwidth, and ISI.

UNIT-V

Spread Spectrum Techniques: Fundamental concepts - Direct sequence spread spectrum - Frequency hopping spread spectrum.

Text Books:

Herbert Taub and Donald L Shilling, Principles of Communications Systems, 2nd edition, McGraw Hill Publishing, 2003 Simon Haykin, Principles of Communication, Prentice Hall of India, 1990.

References Books:

Thomas and Chandrasekar - communication Theory, 1st Edition year 2006, TMH, New Delhi.

Lathi B.P, Analog and Digital Communication Systems, Prentice Hall of India, 1992.

J.G. Proakis, Digital Communication, McGraw Hill, 4th edition, 1995.

Edward. A. Lee and David. G. Messerschmitt, Digital Communication, 3rd edition, 2003, Allied Publishers.

J Marvin.K.Simon, Sami. M. Hinedi and William. C. Lindsey, Digital Communication Techniques: Signal Design and Detection, 1994, Prentice Hall of India.

OPEN ELECTIVE PAPER 1 DIGITAL DATA HANDLING

UNIT I : WORKFLOW

Workflow - types, Automated workflow - components, File Preparation, Preflighting, Digital Imposition – preRIP, postRIP, OPI, Trapping, Postscript, PDF, Metadata – JDF, XML.

UNIT II : NETWORKING

Data transmission fundamentals, Communication media, Data interfaces, Concepts and principles of computer networks, PAN, LAN, WAN, MAN, Network Topologies, Network protocols – FTP, TCP/IP, Network Node components – Hubs, Bridges, Routers, Gateways, Switches, Internet – principles, Client/Server model

UNIT III : FILE FORMATS & COMPRESSION TECHNIQUES

File format – EPS, DCS, JPEG, GIF, TIFF, PNG, Comparison of file formats, Compression techniques, Lossy & lossless compression, RLE, Huffman compression, LZW, DCT, Wavelet, Fractal image encoding, Image quality evaluation, Audio compression, Video Compression.

UNIT IV : DATABASE MANAGEMENT

Database, Types, Database Management, Database Languages, Query processing, Data storage, Backup & recovery, Distributed databases, Data Warehousing, Data Mining

UNIT V : SECURITY

Security in Operating Systems, Principles of Network Security, Cryptography, Fire walls, Intrusion Detection Systems, Secure Email, Digital Rights Management

TEXT BOOK

1. Helmut Kiphhan, "Handbook of Print Media", Springer Verlag, 2001 2. Phil Green, "Understanding Digital Color", 2nd edition, GATF Press, 1999.

REFERENCE BOOKS

- 1. Mani Subramanian, "Network Management: Principles & Practice", Addison wesley, 1999
- 2. Sanjiv Purba, "Handbook of Data Management", Viva Books Private Ltd., 1999
- 3. Douglas E. Comer, "Computer Networks & Internets", 2nd Edition, Pearson Publications, 1999

4. Larry L. Pearson, Bruce S. Davie, "Computer Networks: A Systems Approach", Third Edition, Morgan Kauffman Publishers Inc., 2003

5. Abraham Silberschatz, Henry F. Korth, S.Sudharshan, "Database System Concepts"

SEMESTER II

CORE PAPER 4

VISUAL PROGRAMMING

Objectives:

To learn and understand Windows, Visual Basic and Visual C++ Programming

UNIT-I

Introduction to windows Programming – Event Driven Programming – Data Types – Resources – windows Message – Device context – Document Interfaces – Dynamic Linking Libraries – Software Development Kit (SDK) tools – Context help

UNIT-II

Visual Basic Program – Form Design – VBX control – Properties – Event procedures – Menus and Toolbars – Using Dialog Boxes – Working with control Arrays – Active X controls – Multiple Document Interface (MDI) – File System Controls – Data Control – Database Applications

UNIT-III

Visual C++ Programming – Frame work classes – VC++ Components - Resources – Event Handling – Message Dispatch system – Model and Modeless Dialogs – Important VBX Controls – Document view architecture – serialization – Multiple Document Interface – splitter windows – Coordination between controls.

UNIT-IV

Database Connectivity – Embedding Controls in view – Creating user defined DLL s – Dialog based applications – Dynamic data transfer functions – Database management with ODBC – communicating with other applications – Object linking and embedding.

UNIT-V

Basics of GUI Design - Visual Interface Design - File System - Storage and Retrieval System

Text Books:

Petzold,"Windows Programming", Microsoft Press 1995. Marion Cottingham,"Visual Basic",Peachpit Press,1999. Kate Gregory,"Using Visual C++",Prentice Hall of India,1999.

References Books:

Pappar and Murray,"Visual C++: The Complete Reference", Tata McGraw Hill,2000.

CORE PAPER – 5

COMPUTER NETWORKS

Objectives:

Understand the basics of Computer Networks. Understand the operation of the protocols that are used Computer Networks.

UNIT-I

Introduction : Applications of Computer Network - Hardware and Software - Protocol Hierarchies - Design Issues of the layers - Interfaces and services - Service Primitives - Reference Models : The OSI Reference model-The TCP/IP Reference Model -Types of computer Network : LAN,MAN,WAN- Topologies - Transmission Media - Concept of data transmission - Switching Techniques - ISDN and ATM.

UNIT-II

Data Link Layer: Data Link Layer design issues - Framing - Flow control - Error Detection and Correction – Data link protocols: Stop and Wait Protocol - Sliding window protocol - Medium access sub layer: Channel allocation –static and dynamic - Multiple access protocol – FDDI - Data Link Layer in the Internet – SLIP - PPP.

UNIT-III

Network Layer : The Network Layer Design Issues - comparison of virtual circuits and datagram subnets - connectionless internetworking - Internetwork routing - Routing algorithms – Fragmentation - The Network Layer in the Internet – The IP Protocol - IP Address - subnets - Internet control protocols - internet multicasting.

UNIT-IV

Transport Layer : The Transport layer services - The concept of client and server in terms of socket addressing - Quality of service - Transport service primitives and buffering – Multiplexing - Crash Recovery - The Internet Transport Protocols (TCP/IP) – The TCP protocol, The TCP segment header, TCP connection management - TCP transmission policy - TCP congestion control - UDP.

UNIT-V

Presentation and Application Layer : Network Security – Traditional Cryptography - Two fundamental Cryptographic Principles – Symmetric and Asymmetric Key Algorithms - DNS - SNMP -E-mail.

Text Books:

Computer Networks," Andrew .S. Tanenbaum", Prentice Hall of India, 2003

References Books:

Forouzan: Data Communication and Networking, Special Indian Edition 4th Edition 2006, TMH, New Delhi.

Shashi Banzal, "Data and Computer Network Communication", Firewall Media, 2007.

J.F Kurose and K.W. Ross, Computer Networking - A top-down approach featuring the internet, Addison Wesley, 2001.

William Stallings, Data & Computer Communication, 6th Edition, Pearson Education, 2002.

Mani Subramanian, Network Management: Principles and Practice, Addison Wesley, 2000.

CORE PAPER - 6

SOFTWARE ENGINEERING

Objectives:

The objective of this subject is to make the student familiar with the principles, management and practical methodology followed in any software engineering project development, its implementation and maintenance.

UNIT-I

Software characteristics - Software Engineering Layers - Software Process - Process Models - Linear Sequential, Evolutionary and Formal Methods - Software Measurement Size Oriented, Function Oriented, Extended Function Point Metrics, Metrics for quality.

UNIT-II

Software Project Planning - Software Scope, Resources - Project Estimation - Problem Based, LOC Based, Process Based Estimation - Estimation Models - COCOMO Model - Software Quality - Quality Assurance - Software Reviews - Formal Technical Reviews - Statistical Quality Assurance - Software Reliability - SQA Plan.

UNIT-III

Software Requirement Analysis - Communication Techniques - Analysis Principles - Software Prototyping -Specification - Software Design Concepts - Effective Modular Design - Cohesion - Coupling - Design Documentation - Real Time and Design Methods - Data, Architecture, Transform and Transaction Mapping, Interface and Procedural Design.

UNIT-IV

Object Oriented Software Engineering - Concepts Identifying the Elements of Object Model - Object Oriented Analysis - Domain Analysis - Object Relationship and Behavior Model Design for Object Oriented Systems - System Design Process - Testing Strategies - Test Case Design and Testing Methods - Metrics for Object Oriented Systems - Class Oriented Metrics - Operation Oriented Metrics - Metrics For Object Oriented Testing and Projects.

UNIT-V

Software Testing - Fundamentals White Box, Black Box, Control Structure Testing - Testing on Specialized Environments, Unit, Integration, Validation, System Testing - Art of Debugging - Software Reengineering - Software Maintenance - Process Model - Reverse Engineering - Forward Engineering - CASE - Building Blocks 0 - Taxonomy I - CASE - Integration Architecture - CASE Repository **Text Books:**

Rogger S.Pressman, "Software Engineering - A Practioners Approach" McGraw Hill Companies Inc, 1998.

References Books:

Pressman - Software Engineering a Practitioner approach, 6th Edition 2006, TMH, New Delhi.

Ian sommerville, "Software Engineering" Addison Wesley, Fifth Edition, 1986.

Carlo Ghezzi, Mehdi Jazayasi, Dino Mandrioloi, "Fundamentals of Software Engineering" PHI Pvt.Ltd., 1991.

Richard.E.Fairley,"Software Engineering Concepts", Tata McGraw Hill, First Edition, 1985.

CORE PRACTICAL – I

OBJECT ORIENTED PROGRAMMING LAB

Objectives:

The main aim is to familiarize the concepts learned in Object Oriented Programming. To write Programs for various object oriented concepts using C++ and Java.

Programs to implementFunction overloading in C++Simple class design and objects creations in C++Constructor and destructor in C++Operator overloading, friend functionsOverloading assignment operator, type conversionsInheritance and polymorphism in C++Input/output operationSimple class design and objects creation in JavaString handling in JavaControl Structures in JavaExceptions handling in JavaJava I/OMulti-threaded programs in JavaConnecting to Database and accessing databases

CORE PRACTICAL – II RDBMS LAB

Objectives:

To familiarize the concepts learned in RDBMS and to develop various practical applications using SQL and PL/SQL.

Exercises

Study of various SQL commands Implementation of the concept of Normalization Inventory control system with a reorder level Student Mark sheet processing Pay roll processing Electricity bill preparation Telephone Directory Maintenance Bank Transactions Library Information processing

Personal Information system

CORE PRACTICAL – III VISUAL PROGRAMMING LAB

Objectives:

The students will acquire knowledge on software development using the visual programming languages. This course concentrates on the development of software systems in Visual Basic and Visual C++.

Visual Basic

Write a VB project that receives a year number from a text box and month name from list box and displays number of days in the given month. Take care of leap years. Use Lost Focus event for list box.

Write a VB project that stores 10 employee records with fields EMPNO, NAME, AGE, SEX and SALARY, in an array. Display data fields in text boxes and provide command buttons to move to desired record.

Write a VB project that receives a foreign currency value selected from a list box and converts it into equivalent Indian rupees. (e.g. USD 42.45, Sterling 71.30, D.Mark 25.52, SW Franc 31.58, SaudiRiyal 11.40, French Franc 7.60, UAE Dhiram 11.55, Kuwait Dhinar 140.56)

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Write a VB project using control array that creates a scientific calculator with appropriate command buttons. Include the following capabilities for the calculator: +, -, *, /, %, power, square root, square and log (base 10).

Write a VB project to create a screen saver that displays a list of pictures with 1 second pause in between succesive pictures.

Write a VB project for commercial bank operations using SB account database, with the following features:

- 1. ADD NEW ACCOUNT
- 2. DEPOSIT AMOUNT
- 3. WITHDRAW AMOUNT (with minimum balance condition)

4. Calculate simple interest and update balance taking average of last 6 month balance in the account.

5. CLOSE ACCOUNT.

Write a VB project using built in Ax control (Rich Text Box), develop the windows NOTEPAD like editor with File and Edit menus and also display the floating menu whenever necessary.

Write a VB project for a Blood Bank that maintains a list of donors with address and their blood group. Provide the following reporting features:

i) Search and display the address of a particular donor, given the name in a text box.

ii) Display all the donors (using data report)

a) in age group 20-30.

b) in particular city.

c) with particular blood group.

d) male donors with particular blood group

e) female donors with particular blood group.

Write a VB project using Ax DLL or EXE add a class module that would perform the following functions:

a) Test whether the given number is perfect or not

b) Whether the gn% number Armstrong or not

c) Find the factorial of the given number

d) Sum of digits

Write a VB project using Activex X control to create a Textbox that accepts only numeric value. Provide the following properties for the text box: BackColor, Forecolor and Text.

Visual C++

Write Visual C++ win32 application program using MFC that creates a new font.

Write Visual C++ win32 application program using MFC that displays a message "Hello Good Morning!" wherever the user clicks the mouse button on the client area.

Write Visual C++ win32 application program using MFC that allows the user to draw pictures with the help of mouse as a free hand drawing tool.

Write Visual C++ win32 application program using MFC that creates a list box and displays name of the states in India.

Write Visual C++ win32 application program using MFC that displays line, rectangle, rounded rectangle, ellipse and polygon filled with colors.

Write Visual C++ win32 application program using MFC that fills the background of the client area with a bitmap.

Write Visual C++ win32 application program using MFC that displays a menu. Choose the menu items using keyboard accelerator keys and display appropriate messages for the selected command, in message box.

Write Visual C++ win32 application program using MFC that displays the status of ALT, CTRL, SHIFT, NUM LOCK and SCROLL LOCK keys.

Write Visual C++ win32 application program using MFC that displays current mouse coordinates in status bar.

Write Visual C++ win32 application program using MFC that creates two push buttons OK and CANCEL on the client area. Buttons should respond to user click over them and display appropriate message.

SEMESTER II CORE ELECTIVE PAPER 1

(to choose 1 out of 3)

A. INTRODUCTION TO COMPUTATION WITH PYTHON

UNIT I: INTRODUCTION TO COMPUTERS

Introduction to computers, Computer definition, Block diagram of Computer, Hardware Vs Software, Software development life cycle, Structured programming, Computer languages, Creating and running the programs, Number Systems. Introduction to Computer problem solving: Introduction, The problem solving aspect, Top down design, Bottom-up Approach, Implementation of algorithms, The efficiency of Algorithms, Basic Computing Steps and Flow charting (Assignment, Sequencing, Conditionals, Iterations)Practical: Scratch, Raptor

UNIT II: VARIABLES, EXPRESSIONS AND STATEMENTS

Values and types, keywords, Operators Expressions, Interactive mode and script mode, String operations, Comments. Functions & Modules: Function calls, Type conversion functions, Math functions, Adding new functions, Definitions and uses, Flow of execution, Parameters and arguments, Random numbers, the time module, The math module. Conditionals: Conditional execution, Alternative execution, Chained conditionals, Nested conditionals. Iteration: Multiple assignment, Updating variables, the while statement, break, continue.

UNIT III: STRINGS

A string is a sequence, Traversal with for loop, String slices, Strings are immutable, Searching, Looping and counting, String methods, the in operator, String comparison. Tuples: Tuples are immutable, Tuple assignment, Tuples as return values, Lists and tuples, Dictionaries and tuples, Comparing tuples, Sequences of sequences, Debugging. Lists: Traversing a list, List operations, List slices, List methods. Recursion: Stack diagrams for recursive functions, Infinite. Files: Persistence, Reading and writing, Filenames and paths

UNIT IV: CLASSES AND OBJECTS

User-defined types, Attributes, Instances as return values Methods: The init method, The str method, Operator overloading, Polymorphism. Inheritance: Importance, examples. Event handling: Key press events, Mouse events. Exceptions: Catching exceptions, Raising our own exceptions, the finally clause of the try statement.

UNIT V: DEFINITION AND USE OF STACKS:

Abstract data types, The Stack ADT, Implementing stacks with Python lists, pushing and popping, Using a stack to evaluate postfix, Parsing, Evaluating postfix. Queues: The Queue ADT, Linked Queue, Performance characteristics, Improved Linked Queue, Priority queue.

BOOKS RECOMMENDED

1) Think Python - How to Think Like a Computer Scientist, Green Tea Press, Needham, Massachusetts, Allen Downey, Version 2.0.13, June 2014.

2) How to Think Like a Computer Scientist: Learning with Python 3, Peter Wentworth, Jeffrey Elkner, Allen B. Downey and Chris Meyers, Documentation Release 3rd Edition.

B. E-COMMERCE

Objectives:

By the end of the course the student should have :

A background in electronic commerce as it affects small and medium sized business (SMEs) An understanding of how you can develop and implement anE-commerce strategy for your business An E-commerce business plan based on the adoption of a selected E-commerce strategy.

UNIT-I

Introduction: Infrastructure for Electronic Commerce - Networks - Packet Switched Networks - TCP/IP Internet protocol - Domain name Services - Web Service Protocols - Internet applications - Utility programs - Markup Languages - Web Clients and Servers - Intranets and Extranets - Virtual private Network.

UNIT-II

Core Technology: Electronic Commerce Models - Shopping Cart Technology - Data Mining - Intelligent Agents - Internet Marketing - XML and E-Commerce

UNIT-III

Electronic Payment Systems: Real world Payment Systems - Electronic Funds Transfer - Digital Payment - Internet Payment Systems - Micro Payments - Credit Card Transactions - Case Studies.

UNIT-IV

Security: Threats to Network Security - Public Key Cryptography - Secured Sockets Layer - Secure Electronic Transaction - Network Security Solutions - Firewalls.

UNIT-V

Inter/Intra Organizations Electronic Commerce: EDI - EDI application in business - legal, Security and Privacy issues - EDI and Electronic commerce - Standards - Internal Information Systems - Macro forces - Internal commerce - Workflow Automation and Coordination - Customization and Internal commerce - Supply chain Management.

Text Book:

Ravi Kalakota and Andrew B Whinston, Frontiers of Electronic commerce, Addison Wesley, 1996

Reference Books:

Baskar - E-Commerce Framework Technologies and Applications 2nd Edition, 2006, TMH, New Delhi.

Pete Loshin, Paul A Murphy, Electronic Commerce, 2nd Edition, Jaico Publishers1996.

David Whiteley, e - Commerce: Strategy, Technologies and Applications, McGraw Hill, 2000.

C. MICROPROCESSOR AND MICRO CONTROLLER

UNIT I: THE 8086 MICROPROCESSOR

Introduction to 8086 – Microprocessor architecture – Addressing modes – Instruction set and assembler directives – Assembly language programming – Modular Programming – Linking and Relocation – Stacks – Procedures – Macros – Interrupts and interrupt service routines – Byte and String Manipulation.

UNIT II: 8086 SYSTEM BUS STRUCTURE

8086 signals – Basic configurations – System bus timing –System design using 8086 – IO programming – Introduction to Multiprogramming – System Bus Structure – Multiprocessor configurations – Coprocessor, Closely coupled and loosely Coupled configurations – Introduction to advanced processors.

UNIT III :I/O INTERFACING

 $\begin{array}{l} Memory \ Interfacing \ and \ I/O \ interfacing \ - \ Parallel \ communication \ interface \ - \ Serial \ communication \ interface \ - \ D/A \ and \ A/D \ Interface \ - \ Timer \ - \ Keyboard \ /display \ controller \ - \ Interrupt \ controller \ - \ DMA \ controller \ - \ Programming \ and \ applications \ Case \ studies: \ Traffic \ Light \ control, \ LED \ display \ , \ LCD \ display, \ Keyboard \ display \ interface \ and \ Alarm \ Controller. \end{array}$

UNIT IV: MICROCONTROLLER

Architecture of 8051 – Special Function Registers(SFRs) – I/O Pins Ports and Circuits – Instruction set – Addressing modes – Assembly language programming.

UNIT V:INTERFACING MICRO CONTROLLER

Programming 8051 Timers – Serial Port Programming – Interrupts Programming – LCD & Keyboard Interfacing – ADC, DAC & Sensor Interfacing – External Memory Interface- Stepper Motor and Waveform generation.

TEXT BOOKS:

- 1. Yu-Cheng Liu, Glenn A.Gibson, "Microcomputer Systems: The 8086 / 8088 Family Architecture, Programming and Design", Second Edition, Prentice Hall of India, 2007.
- 2. Mohamed Ali Mazidi, Janice Gillispie Mazidi, Rolin McKinlay, "The 8051 Microcontroller and Embedded Systems: Using Assembly and C", Second Edition, Pearson Education, 2011

REFERENCE BOOK:

1. Doughlas V.Hall, "Microprocessors and Interfacing, Programming and Hardware:, TMH, 2012

OPEN ELECTIVE PAPER 2 HTML PROGRAMMING

UNIT I

Web Design Principles: Basic principles involved in developing a web site - Planning process - Five Golden rules of web designing- Designing navigation bar -Page design- Home Page Layout -Design Concept. **Basics in Web Design**: Brief History of Internet- What is World Wide Web -Why create a web site -Web Standards - Audience requirement.

UNIT II

Introduction to HTML :What is HTML -HTML Documents- Basic structure of an HTML document - Creating an HTML document - Mark up Tags - Heading-Paragraphs - Line Breaks - HTML TagsModule.

UNIT III

Elements of HTML: Introduction to elements of HTML -Working with Text - Working with Lists, Tables and Frames- Working with Hyperlinks, Images and Multimedia - Working with Forms and controls.

UNIT IV

Introduction to Cascading Style Sheets: Concept of CSS- Creating Style Sheet- CSS Properties-CSS Styling(Background, Text Format, Controlling Fonts) - Working with block elements and objects - Working with Lists and Tables - CSS Id and Class - Box Model(Introduction, Border properties, Padding Properties, Margin properties) - CSS Advanced(Grouping, Dimension, Display, Positioning, Floating, Align,Pseudo class, Navigation Bar, Image Sprites, Attribute sector)- CSS Color - Creating page Layout and Site Designs.

UNIT V

Introduction to Web Publishing or Hosting: Creating the Web Site - Saving the site - Working on the web site - Creating web site structure - Creating Titles for web pages - Themes-Publishing web sites.

TEXT BOOK

1. Kogent Learning Solutions Inc. HTML 5 in simple steps, Dreamtech Press

2.A beginner's guide to HTML NCSA,14th May,2003

3.Murray, Tom/Lynchburg Creating a Web Page and Web Site College, 2002

REFERENCE BOOKS

1.Steven M. Schafer HTML, XHTML, and CSS Bible, 5ed Wiley India John Duckett

2.Beginning HTML, XHTML, CSS, and JavaScript Wiley India Ian Pouncey, Richard

3.York Beginning CSS: Cascading Style Sheets for Web Design Wiley India Kogent

4.Learning Web Technologies: HTML, Javascript Wiley India.

ANNAMALAI UNIVERSITY

Syllabi for the Affiliated Colleges

BACHELOR OF COMPUTER APPLICATIONS

CBCS PATTERN

(2021-2022)

	Part	Study Components Course Title		Ins. Hrs / week	Credit					
S. No.						Title of the Paper	Maximum Marks			
		SEMESTER I					CIA	Uni. Exam	Total	
1		Language Paper-1		6	4	Tamil/Other Languages	25	75	100	
2	II	English (CE)	Paper-1	6	4	Communicative English I	25	75	100	
3	III	Core Theory	Paper-1	6	4	Programming in C	25	75	100	
4	III	Core Practical	Practical-1	3	2	Programming in C Lab	25	75	100	
5	III	Allied -1	Paper-1	7	3	Mathematical Foundations - I	25	75	100	
6	III	PE	Paper 1	6	3	Professional English I	25	75	100	
7	IV	Environmental Studies		2	2	Environmental studies	25	75	100	
		Sem. Total		36	22		175	525	700	
		SEMESTE				CIA	Uni. Exam	Total		
7		Language	Paper-2	6	4	Tamil/Other Languages	25	75	100	
8	II	English (CE)	Paper-2	6	4	Communicative English II	25	75	100	
9		Core Theory	Paper-2	5	4	C++ & Data Structure	25	75	100	
10	III	Core Practical	Practical-2	2	2	C++ and Data Structures Lab	25	75	100	
11	III	Allied-1	Paper-2	7	5	Mathematical Foundations - II	25	75	100	
12	ш	PE	Paper 1	6	3	Professional English II	25	75	100	
13	IV	Value Education		2	2	Value Education	25	75	100	
14	IV	Soft Skill		2	1	Soft Skill	25	75	100	
		Sem. Total		36	25		200	600	800	

ANNAMALAI UNIVERSITY BACHELOR OF COMPUTER APPLICATIONS

SYLLABUS UNDER CBCS (2021-2022)

SEMESTER I

CORE THEORY PAPER -1 PROGRAMMING IN C

OBJECTIVES:

- 1. To understand simple algorithms,
- 2. To understand language constructs
- 3. To understand and develop programming skills in C.
- 4. To understand the basic concepts of decision making and looping statements.
- 5. To understand the concepts of arrays, structures, union, pointers and files.

UNIT – I

Overview of C: History – Importance – Sample Programs – Basic Structure – Programming Style – Executing – Unix System – MS-DOS System - **Constants, Variables, and Data Types:** Character Set – C Token – Keyword and Identifiers – Constants – Variables – Data Types – Declaration of Storage Class – Assigning Values to Variables – Defining Symbolic Constants – Declaration – Overflow and Underflow of Data - **Operators and Expressions:** Arithmetic, Relational, Logical, Assignment, Increment and Decrement, Conditional, Bitwise, Special Operators – Arithmetic Expressions, Evaluation of Expressions – Precedence of Arithmetic Operators – Some Computational Problems – Type Conversions in Expressions – Operator Precedence and Associativity – Mathematical Functions.

UNIT – II

Managing Input and Output Operations: Reading, Writing a Character – Formatted Input, Output - **Decision Making and Branching:** Decision Making with If statement – Simple If Statement – The If...Else Statement – Nesting of If...Else Statements – The Else If Ladder – The Switch Statement- The ?: Operator – The Goto Statement - **Decision Making and Looping:** The while Statement – The do Statement – The for Statement – Jumps in Loops – Concise Test Expressions.

UNIT – III

Arrays: One-Dimensional Arrays - Declaration, Initialization of One-Dimensional Arrays – Two-Dimensional Arrays - Initializing Two-Dimensional Arrays – Multi-Dimensional Arrays – Dynamic Arrays - **Character Arrays and Strings:** Declaring and Initializing String Variables – Reading Strings from Terminal – Writing Strings to Screen – Arithmetic Operations on Characters – Putting String Together – Comparison of Two Strings –String-Handling Functions – Table of Strings – Other Features of Strings - **User Defined Functions**: Need for User-Defined Functions – A Multi-Function Program – Elements of User-Defined Functions – Definition of Functions – Return Values and Their Types – Function Calls – Function Declaration – Category of Functions – No Arguments and No Return Values – Arguments but no return values – Arguments with Return Values – No Arguments but Returns a value – Functions that Return Multiple Values – Nesting of Functions – Recursion – Passing Arrays, Strings to Functions – The Scope, Visibility and Lifetime of Variables – Multi file Programs.

$\mathbf{UNIT} - \mathbf{IV}$

Structure and Unions: Defining a Structure – Declaring Structure Variables – Accessing Structure Members – Structure Initialization and Copying and Comparing Structure Variable – Operations on Individual Members – Arrays of Structures – Arrays within Structures – Structures within Structures – Structures and Functions – Unions – Size of Structures – Bit Fields **Pointers**: Understanding Pointers – Accessing the Address of Variable – Declaring, Initialization of Pointer Variables – Accessing a Variable through its pointer – Chain of Pointers – Pointer Expression – Pointer Increments and Scale Factor – Pointers and Arrays – Pointers and Character Strings – Array of Pointers – Pointers as Function Arguments – Functions Returning Pointers – Pointers to Functions – Pointers and Structures – Troubles with Pointers **File Management in C**: Defining and Opening a File – Closing a File – Input/Output Operations on File – Error Handling During I/O Operations – Random Access to Files – Command Line Arguments.

UNIT – V

Fundamental Algorithms: Exchanging the values of Two Variables- Counting- Summation of a Set of Numbers-Factorial Computation -Sine Function Computation –Generation of the Fibonacci Sequence-Reversing the Digits of an Integer- Base Conversion – Character to Number Conversion - Factoring Methods: Finding the square Root of a Number –The Smallest Divisor of an Integer-The Greatest Common Divisor of the two integers-Generating Prime Numbers- Computing the Prime Factors of an integer –Generation of Pseudo-random Numbers-Raising a Number to a Large Power-Computing the nth Fibonacci Number (Chapters: 2 & 3)

TEXT BOOK:

1. Programming in ANSI C, E. Balagurusamy, Tata McGrawhill Education, 6th Edition, 2013. (Unit I to IV)

2. How to Solve it by Computer, R.G.Dromey, PHI International (Unit V)

REFERENCE BOOKS:

1. The C Programming Language (ANSI C), Kernighan, B.W. and Ritchie, D.M., PHI.

2. C by Discovery, Foster & Foster, Penram International Publishers, Mumbai.

E - REFERENCES

1. NPTEL, Introduction to C Programming, Prof.SatyadevNandakumar ,IIT, Computer Science and Engineering Kanpur.

2. NPTEL, Introduction to Problem Solving & Programming, by Prof. Deepak Gupta Department of Computer Science and Engineering IIT Kanpur.

Course Outcomes:

- The Student will be able to understand the concepts of Constants, Variables, and Data Types, Operators and Expressions
- The Student will be able to understand the concepts of Managing Input and Output Operations, Decision Making and Branching, Decision Making and Looping.
- The Student will be able to understand the concepts of Arrays, Character Arrays and Strings, User Defined Functions.
- The Student will be able to understand the concepts of Structure and Unions, Pointers, File Management in C.
- The Student will be able to understand the concepts of Fundamental Algorithms, Factoring Methods.

CORE PRACTICAL-1

Programming in C – Lab

Objectives:

- 1. To understand concepts of for/while loop and switch.
- 2. To understand language Functions and recursions.
- 3. To understand and develop String Manipulations.
- 4. To understand the basic concepts of searching and sorting.
- 5. To understand the concepts of structures.

Outcomes:

CO1 - Enhance the analyzing and problem solving skills and use the same for writing programs in C.

CO2 - Write diversified solutions, draw flowcharts and develop a well-documented and indented

program according to coding standards.

- CO3 Learn to debug a given program and execute the C program.
- CO4 To have enough practice the use of conditional and looping statements.
- CO5 To implement arrays, functions and pointers.

Control Statements:

- 1. Print n Fibonacci numbers (using for)
- 2. Print n Prime numbers (using while)
- 3. Simple arithmetic on two numbers (using switch/case)

Functions:

4. Swap two values using call by value / call by reference.

Recursion:

5. To compute NcR and NpR

6. To Compute GCD and LCM

String Manipulation.

7. Operations on string such as length, concatenation, reverse, counting, and copy of a string to another.

Matrices:

8. Matrix Addition, Subtraction, Multiplication, Transpose of n x m matrices.

9. Inverse of a square matrix.

Searching:

10. Binary Search.

Sorting: 11. Bubble Sort

12. Insertion Sort

Structures:

13. Students Mark statement

Pointers:

14. Arithmetic operations on pointers.

Files

15. Creating/ Reading/ Writing a text/binary file.

REFERENCE BOOK:

1. Programming in ANSI C, E. Balagurusamy, Tata McGrawhill Education, 6th Edition, 2013.

ALLIED 1

PAPER - I

MATHEMATICAL FOUNDATIONS - I

Objectives

To know about Logical operators, validity of arguments, set theory and set operations, relations and functions, Binary operations, Binary algebra, Permutations & Combinations, Differentiation, Straight lines, pair of straight lines, Circles, Parabola, Ellipse, Hyperbola.

UNIT-I: SYMBOLIC LOGIC

Proposition, Logical operators, conjunction, disjunction, negation, conditional and bi-conditional operators, converse, Inverse, Contra Positive, logically equivalent, tautology and contradiction. Arguments and validity of arguments.

UNIT-II: SET THEORY

Sets, set operations, venndiagram, Properties of sets, number of elements in a set, Cartesian product, relations & functions,

Relations : Equivalence relation. Equivalence class, Partially and Totally Ordered sets,

Functions: Types of Functions, Composition of Functions.

UNIT-III: BINARY OPERATIONS

Types of Binary Operations: Commutative, Associative, Distributive and identity, Boolean algebra: simple properties. Permutations and Combinations.

UNIT-IV: DIFFERENTIATION

Simple problems using standard limits,

Lt $\underline{x^{n}-a^{n}}$, lt \underline{sinx} , lt \underline{tanxlt} $e^{\underline{x}-1}$, lt $\frac{(1+1/n)^{n}}{1/n}$, lt (1+n)X $\overline{x-a} x \rightarrow \overline{x} x \rightarrow x x 0 \rightarrow n 0 \rightarrow$

Differentiation, successive differentiation, Leibnitz theorem, partial differentiation, Applications of differentiation, Tangent and normal, angle between two curves.

UNIT-V: TWO DIMENSIONAL ANALYTICAL GEOMETRY

Straight Lines - Pair Straight Lines

Text Book.

P.R. Vittal, Mathematical Foundations – Maragham Publication, Chennai.

Reference Books

- 1. U. Rizwan, Mathematical Foundation SciTech, Chennai
- 2. V.Sundaram& Others, Dircrete Mathematical Foundation A.P.Publication, sirkali.
- 3. P.Duraipandian& Others, Analytical Geometry 2 Dimension Emerald publication 1992 Reprint.
- 4. Manicavachagompillay&Natarajan. Analytical Geometry part I Two Dimension S.Viswanathan (printers & publication) Put Ltd., 1991.
SEMESTER II

CORE THEORY PAPER -2

C++ & DATA STRUCTURES

Objectives:

- 1. To understand the concepts of object-oriented programming and master OOP using C++.
- 2. To understand the concepts of Inheritance, polymorphism and templates.
- 3. To understand the concepts of different view of data, stack and queues.
- 4. To understand the concepts of Programming with Recursion, Binary Search Tree and graphs.
- 5. To understand the concepts of Sorting and Searching Algorithms.

UNIT-I:

Principles of Object Oriented Programming – Beginning with C++ – Token , Expressions and Control Structures- Functions in C++ – Classes and Objects – Constructors and Destructors.

UNIT-II:

Operator Overloading and Type Conversions – Inheritance : Extending Classes – Pointers, Virtual Functions and Polymorphism - Managing Console I/O Operations. Working with Files - Templates – Exception Handling – Manipulating Strings.

UNIT-III:

Data Design & implementations: Different views of data – Abstraction and Built-in Types – Arrays

ADTs Stacks and Queue (Linear and Linked), Stack (Array and Pointer)- Applications- Infix to Postfix Conversions – Queue(Array and Pointer) – List(Array and Pointer) – Applications: (Polynomial Addition) - Doubly Linked Lists.

UNIT – IV:

Programming with Recursion : Recursion – Verifying and Writing Recursive Functions – **Binary Search Tree :** Implementation – Tree Traversal – **Graphs:** Implementations – BFS – DFS – Dijkstras Shortest Path Algorithm.(*Chapter 7:Section 7.1,7.4 7.5, Chapter 8:Section 8.1,8.4, Chapter 9:Section 9.3*)

UNIT-V:

Sorting and Searching Algorithms: Sorting – Searching – Hashing (*Chapter 10: Section* 10.1,10.2,10.3)

TEXT BOOK:

1. Object Oriented Programming with C++, E Balagurusamy , Tata McGraw Hill, 6th Edition, 2014.

(Units I, II)

2. C++ Plus Data Structure, Nell Dale, Jones & Bartlett Publishers , $4{\rm th}\,Edition,\,2010.$ (Units III, VI & V)

REFERENCES:

1. C++ The Complete Reference, Herbert Schildt, Tata McGraw Hill, 4th Edition, 2003.

2. OOP In ANSI C and Turbo C, Ashok N.Kamthene, Pearson Education, 6th Edition, 2008.

3. Data Structures and Algorithms, Alfred V. Aho, Jeffrey D. Ullman, John E. Hopcroft, Addison Wesley Longman Inc., 2nd Edition, 1999.

Course Outcomes:

- The Student will be able to understand the concepts of object oriented programming Apply structure and inline functions.
- The Student will be able to understand the concepts of the types of inheritances and Applying various levels of Inheritance for real time problems Apply the OOPs concepts class and object. Understand Explain the file concept and exception handlings in C++
- The Student will be able to understand the concepts of Stacks and Queue using array and pointers.
- The Student will be able to understand the concepts of Recursion, Binary Search Tree and graphs.
- The Student will be able to understand the concepts of Sorting and Searching Algorithms.

CORE PRACTICAL -2

C++ & DATA STRUCTURES LAB

Objectives:

- 1. To develop C++ programming skills in design
- 2. To understand the basic concepts of different abstract types and structure of data.
- 3. To understand the concepts of Function Overloading
- 4. To understand the concepts of Stack, Queue, List, Doubly Linked List using Pointersusing Arrays.
- 5. To understand the concepts of Searching and Sorting Algorithms.

LIST OF LAB EXERCISES

- 1. Constructors & Destructors, Copy Constructor.
- 2. Friend Function & Friend Class.
- 3. Inheritance.
- 4. Polymorphism & Function Overloading.
- 5. Virtual Functions.
- 6. Overload Unary & Binary Operators Both as Member Function & Non Member Function.
- 7. Class Templates & Function Templates.
- 8. Exception Handling Mechanism.
- 9. Standard Template Library concept.
- 10. File Stream classes.
- 11. Array implementation of Stack, Queue : Infix to postfix

12. Implementation of Stack, Queue, List, Doubly Linked List - using Pointers- Polynomial Addition

- 13. Implementation of Binary Search Tree, Traversal
- 14. Implementation of Searching and Sorting Algorithms.
- 15. Graph Implementation of shortest path (Djikstras)

REFERENCE :

- 1. Object Oriented Programming with C++, E Balagurusamy , Tata McGraw Hill, 6th Edition, 2014.
- 2. C++ Plus Data Structure, Nell Dale, Jones & Bartlett Publishers, 4th Edition, 2010.

Course Outcomes:

- Understand the Creating and Deleting the Objects with the Concepts of Constructors and Destructors.
- Demonstrate the Polymorphism Concepts and Operator Overloading.
- Understand basic Data Structures such as Arrays, Linked Lists, Stacks, Queues, Doubly Linked List and Infix to Postfix Conversion.
- Apply Algorithm for solving problems like Sorting and Searching.
- Apply Algorithms and use Graphs and Trees as tools to visualize and simplify Problems

ALLIED – 1 PAPER –2 MATHEMATICAL FOUNDATIONS II

Objectives

To know about Matrix Operations, Symmetric, Skew-Symmetric, Hermitian, Skew-Hermitian, Orthogonal, Unitary Matrices. Rank of a Matrix Solutions of linear equations Consistency and Inconsistency, Characteristic roots and Characteristics Vectors, Cayley - Hamilton Theorem, Integration of rational functions, Integration by parts, Reduction formulae, Area and volume using integration, Planes, Straight lines, Spheres, Curves, Cylinders.

UNIT-I: MATRICES

Multiplication of matrices, Singular and Non-Singular matrices, Adjoint of a Matrix, Inverse of a matrix Symmetric and Skew-Symmetric, Hermitian and Skew-Hermition, Orthogonal and unitary matrices, Rank of a matrix, Solution of Simultaneous Linear equations by

(i) Cramer's rule.

(ii) Matrix Inversion Method.

UNIT-II: MATRICES

Test for Consistency and Inconsistency of linear equations, (Rank Method), characteristic roots and characteristic vectors, Cayley - Hamilton theorem, matrix of linear transformations: reflection about the x, y axes and the line y=x, rotation about the origin through an angle, expansion or compression, shears, translation.

UNIT-III

Integration Simple problems, integration of rational function involving algebraic expressions of the form

1 , 1 , px+q px+q ,px+q ax^2+bx+c $\sqrt{ax^2+bx+cax^2+bx^2+bx+cax^2+bx+cax^2+bx+cax$

integrations using simple substitutions integrations involving trigonometric functions of the form

<u> 1 , 1 ,</u>

a+bcosx $a^2 sin^2 x+b^2 cos^2 x$ Integration by parts.

UNIT-IV

Properties of definite integrals. Reduction formulae for

 $\int x^n e^{ax} dx$, $\sin^n x dx$, $\cos^n x dx$, $\int x^m (1-x)^n dx$, applications of integration for (i) Area under plane caurves, (ii) Volume of solid of revolution.

UNIT-V: ANALYTICAL GEOMETRY OF THREE DIMENSION

Planes, straight lines.

Text Book.

P.R.Vittal, Mathematical Foundations - Margham Publication,

Chennai.

Reference Books

- 1. U. Rizwan, Mathematical Foundation SciTech, Chennai
- 2. V.Sundaram& Others, Dircrete Mathematical Foundation A.P.Publication, sirkali.
- 3. P.Duraipandian& Others, Analytical Geometry 3 Dimension Emerald publication 1992 Reprint.
- 4. Manicavachagompillay&Natarajan. Analytical Geometry part II three Dimension S.Viswanathan (printers & publication) Put Ltd., 1991.

ANNAMALAI UNIVERSITY Syllabi for the Affiliated Colleges BACHELOR OF ARTS

B.COM.

DEGREE COURSE

CBCS PATTERN

(2021 - 2022)

The Course of Study and the Scheme of Examinations

S NO	Dort	Study Comp	onents	Ins.	Cradit	Title of the Dapor	Maximum Marks		
3.100.	rait	Course T	itle	/week	crean	The of the Paper	CIA	Uni. Exam	Total
		SEMES	TER I						
1	Ι	Language	Paper-1	6	4	Tamil/Other Languages	25	75	100
2	II	English (CE)	Paper-1	6	4	Communicative English I	25	75	100
3		Core Theory	Paper-1	5	3	Financial Accounting -I	25	75	100
4	III	Core Theory	Paper-2	5	3	Business Organization	25	75	100
5	III	ALLIED -1	Paper-1	6	3	 (to choose 1 out of 3) 1. Indian Economy I 2. Elements of Insurance 3. Consumerism 	25	75	100
6	III	PE	Paper-1	6	3	Professional English I	25	75	100
7	IV	Environmental Studies		2	2	Environmental Studies	25	75	100
				36	22		175	525	700
	SEMESTER II				CIA	Uni. Exam	Total		
8	Ι	Language	Paper-2	6	4	Tamil/Other Languages	25	75	100
9	II	English (CE)	Paper-2	4	4	Communicative English I	25	75	100
10		Core Theory	Paper-3	5	3	Financial Accounting –II	25	75	100
11	III	Core Theory	Paper-4	5	3	Office management	25	75	100
12	III	ALLIED-1	Paper-2	6	5	 (to choose 1 out of 3) 1. Indian Economy II 2. Merchant banking 3. Business Mathematics 	25	75	100
13		PE	Paper-2	6	3	Professional English II	25	75	100
14	IV	Value Education		2	2	Value Education	25	75	100
15	IV	Soft Skill		2	1	Soft Skill	25	75	100
				36	25		200	600	800

B.COM. GENERAL

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

PEO 1: To excel with the much needed business education, to ensure that students to be more competitive for employment and higher education.

PEO 2: To develop a broad range of business skills and knowledge, development of general and specific capabilities to meet the current and future expectation of business, industries and economy at the national and global level.

PROGRAMME OUTCOMES (POs)

PO 1: To have comprehensive knowledge of finance, accounting, taxation, economics and business laws.

PO 2: To equip with professional, inter-personal and entrepreneurial skills for economic and social growth.

PO 3: To gear up with updated knowledge in implementing business practices.

PO 4: To acquire effective skills like communication, decision making, problem solving in business activities.

PO 5: To blend knowledge, skill and attitude that will sustain an environment of learning and creativity.

PO 6: To impart value based and job oriented education, which ensures that the students are trained into up-to-date.

ANNAMALAI UNIVERSITY B.Com. (GENERAL)

SYLLABUS UNDER CBCS (2021-2022)

SEMESTER I

CORE PAPER - 1

FINANCIAL ACCOUNTING I

OBJECTIVES

- 1. To understand the basic Principles and practical Applications of Accounting
- 2. To have practical knowledge in the preparation of Double Entry System
- 3. To draft the Final Accounts as per the Accounting standards
- 4. To acquire knowledge about Depreciation accounting
- 5. To gain expertise in preparation of Single Entry System
- 6. To gain knowledge about importance of Tally

UNIT-I: Introduction

Meaning of accounting – objectives– advantages -limitations - Accounting concepts and conventions - Methods of accounting - Journal - Ledger– Trial Balance - Rectification of Errors with and without suspense a/c.

UNIT-II: Final accounts

Meaning of final accounts – adjustments in preparation of final accounts – preparation of trading, profit & loss account and balance sheet of sole proprietorship concern.

UNIT-III: Depreciation

Meaning of depreciation – causes– need– Methods of calculating depreciation: straight line method and written down value method (change in method of depreciation is excluded) – Methods of recording depreciation: by charging depreciation to assets account or by creating provision for depreciation account.

UNIT-IV: Single entry system

Meaning of single entry system – features and limitations of single entry system – Distinction between single entry system and double entry system - Methods of calculation of profit:

Statement of affairs method and Conversion method – Distinction between statement of affairs and balance sheet.

UNIT-V: Introduction to Tally

Accounts Basics- Accounts Basics - Understanding the Components of Computer, Classification of Softwares - Challenges associated with accounting on computers and solutions there on - Software training to enhance employability - Growth of Tally.

Note: Questions in Sec .A, B & C shall be in the proportion of 20:80 between Theory and Problems.

TEXT BOOKS

S.NO	AUTHORS	TITLE	PUBLISHERS
1	T.S. Reddy & Dr.	Financial Accounting	Margham Publications
	A.Murthy		Chennai.
2.	Jain &Narang,	Financial Accounting	Kalyani Publishers
3	S.N. Maheshwari	Financial Accounting	S.Chand Publications

REFERENCE BOOKS

S.NO	AUTHORS	TITLE	PUBLISHERS
1.	Hanif and Mukherjee	Financial Accounting	McGraw-Hill
			Publications
2.	Murugadoss, Jaya,	Financial Accounting	Vijay Nicholes Imprint
	Charulatha and Baskar		Pvt. Ltd., Publications
3.	Shukla & Grewal	Advanced Accounting	S.Chand & Co.
			Publications
4.	Parthasarathy.S.	Financial Accounting	Kalyani Publishers,
	&Jaffarulla,		NewDelhi
5.	Gupta, R.L & Gupta V.K,	Advanced Accounting	Sulthan chand and sons
			Publications
6.	Ashok Sehgal &Deepak	Fundamental of Financial	Taxman Publications
	Sehgal	Accounting	
7.	Tulsian	Financial Accounting	Pearson Publications

COURSE OUT COMES

Units	CO Statement	
Unit 1	After studied unit-1, the student will	Understand the basic fundamentals of
UnitI	be able to	Double Entry System Accounting
Unit2	After studied unit-2, the student will	Prepare Final Accounts

	be able to	
Unit3	After studied unit-3, the student will	Understand the depreciation accounting
	be able to	
Unit4	After studied unit-4, the student will	Prepare the accounts in Single Entry
	be able to	system
Unit 5	After studied unit-5, the student will	Understand the importance of Tally
	be able to	Accounting

CORE THEORY PAPER – 2

BUSINESS ORGANIZATION

OBJECTIVES:

- 1. To enable the students to understand the basic concepts of Business Organization.
- 2. To make the students to know the functioning of MNC's in India.

UNIT – 1

Introduction

Business – Meaning – Characteristics - Objectives - Criteria for Success in Modern Business – Classification of Business-Profession - Meaning-Distinction between Business and Profession - Social Responsibility of Business.

UNIT – 2

Forms of Business Organisation

Sole Trader, Partnership Firm, Limited Liability Partnership, Cooperative Societies and Joint Stock Company: Definition – Meaning – Characteristics – Advantages – Limitations - One Man Company- Virtual Organization- Private and Public Limited Company – Government Companies – Public Utilities.

UNIT – 3

Location of Industry

Plant Location: Meaning - Theories of Location - Factors Influencing Location - Plant Layout: Definition - Meaning - Objectives - Characteristics of Good Layout - Size of Firm: Meaning - Concept of Size - Measures of Size.

UNIT-4

Business Combination

Definition - Meaning – Advantages and Limitations – Types of Combination – Chamber of Commerce: Meaning – Advantages and functions – Trade Associations: Features and functions.

UNIT-5

Multinational Corporations (MNC's)

Definition - Distinction among IC, MNC, GC and TNC - Characteristics of MNC's-cultural impact of MNC's. Factors contributed for the growth of MNC's – Advantages and Disadvantages of MNC's – Control over MNC's – Organization Design and Structure of MNC, s – Relationship between Headquarters and Subsidiaries – MNC's in India.

TEXT BOOKS

S.NO	AUTHORS	TITLE	PUBLISHERS
1.	Dinkar Pagare	Business Organization &	Sultan Chand & Sons,
		Management	New Delhi.
2.	C.B. Gupta	Business Organization &	Sultan Chand & Sons, New Delhi
		Wanagement	New Denn.

REFERENCE BOOKS

S.NO	AUTHORS	TITLE	PUBLISHERS
1.	P.N. Reddy & S.S.	Business Organization	Eurasia Publishing
	Gulshan		House (Pvt.) Ltd, New
			Delhi.
2.	Prof. C.D. Balaji& Dr. G.	Business Organization	Margham Publications,
	Prasad		Chennai.
3.	Kathiresan & Dr. Radha	Business Organization	Prasana Publishers,
			Chennai.
4.	Y.K. Bhushan	Fundamentals of Business	Sultan Chand & Sons,
		Organization &	New Delhi.
		Management	
5.	Dr. P. Subba Rao	International Business –	Himalaya Publishing
		Text and Cases	house, New Delhi.

COURSE OUTCOMES

UNITS	CO STATEMENT	
TT	After studied unit-1, the student will	Knowledge about Business and
UIIII	be able to	Profession
Unit2	After studied unit-2, the student will	Understand the different Forms of
	be able to	Business Organization.
Unit3	After studied unit-3, the student will	Explore the theories of Plant Location
	be able to	and characteristics of Layout.
Unit4	After studied unit-4, the student will	Know the concept of Business
	be able to	Combinations and functions of Chamber
		of commerce, Trade Association.
Unit 5	After studied unit-5, the student will	Understand the basic Concepts of MNCs
	be able to	

ALLIED – 1 (To choose any 1 out of the given 3) PAPER –1 1. INDIAN ECONOMY - I

Course Objectives:

- 1. The salient objective of this paper is to introduce the students to understand the main concepts of the Indian Economy.
- 2. The concepts which help to the students to assess gain knowledge on various Economic Policies of the Government and also students should know that India is a fifth largest economy.
- 3. The students become aware of the Agriculture and Agriculture Labour.
- 4. The students become aware of the various challenges of the Indian economy.
- 5. Students are able to analyse current economic scenario in India.
- 6. To impart knowledge about the functioning of industries.

UNIT: I Introduction

Features of developing Economics - Economic and Non-Economic factors impeding Economic development - Concept of growth and development.

UNIT: II Human Development, Poverty and Unemployment.

Human development – Components of human development – HD Index – Population Growth – Measures to control population - Recent Population Policy – Poverty Alleviation Programmes – Unemployment – Types – Causes and Effects.

UNIT: III Agriculture

Indian Agriculture – Contribution to Economic Development – Agricultural Productivity – Land Reforms – Green Revolution II.

UNIT: IV Agricultural labour

Agricultural labour – Definition – Features - Problems – Remedies - Agricultural Credit - Grameen Bank.

UNIT: V Industry

Meaning and Definition of Industry – Role of Industries – Industrial Policy of 1991 and recent changes – Role of Small Scale Industry in economic development – Large Scale Industry in India – Industrial Development Under Five Year Plans.

Text Books

Unit- I: Indian Economy Sankaran.S Margham Publications 7th edition 2014

Unit-II: Indian Economy Ruddar Dutt & Sundaram KPN Sulan Chand Publishing 7th edition 2016

Unit-III: Indian Economy Sankaran.S Margham Publications 7th edition 2014

Unit-IV: Indian Economy Sankaran.S Margham Publications 7th edition 2014

Unit- V: Indian Economy Sankaran.S Margham Publications 7th edition 2014

Reference Books:

1.Ruddar Dutt & Sundaram KPN Indian Economy S Chand Publishing7thedition

2016

2. Sankaran .S.IndianEconomy Margham Publications 7th 2014

3. Dhingra I.C. Indian Economy Manakin Press Sultan Chand & Sons 28th edition.

4.Puri V.K &Misra S.K Indian Economy Himalaya Publishing House 35th 2017

5. Agarwal A.NIndian Economy New Age 41st 2016

6. KK Dewett JD Varma & M SharmaIndian Economy S Chand & Company Pvt Ltd 1st 2016

7. Jhingan M.L Economics of Development & Planning Vrinda Publication 41st 2016

E- Materials

- 1. www.studydhaba.com/indian-economy-study-material-pdf
- 2. www.examrace.com/IEcoS/IEcoS-Study-Material
- 3. www.winmeen.com/tnpsc-indian-economy-study-materials
- 4. www.jagranjosh.com/articles/ias-prelims-2015-gs...
- 5. www.governmentexams.co.in/tnpsc-indian-economy-notes
- 6. www.clearias.com/ias-study-materials
- 7. www.tnpscshouters.com/2019/02/tnpsc-indian...
- 8. www.hirensir.com/indian-economy-in-gujarati-pdf

Course Out Comes

1. After studied unit-1, the student will be able to understand the various indicators of economic development.

2. After studied unit-2, the student will be able to understand the importance, causes and impact of population growth.

3. After studied unit-3, the student will be able to gain knowledge about the role of agriculture in economic development.

4. After studied unit-4, the student will be able to gain knowledge about the role of agriculture labour problems and remedies .

5. After studied unit-5, the student will be able to understand the industrial development during plan periods.

ALLIED – 1 PAPER –1

2. ELEMENTS OF INSURANCE

OBJECTIVES

- 1. To aims to educate students about the significance and purpose of insurance.
- 1. To enable the Knowledge about the Insurance.
- 2. To acquire skills about the Life Insurance and its types.
- 3. To know about the Fundamental principles of fire insurance.
- 4. To know about the Fundamental principles of marine insurance.
- 5. To gain insights in E insurance.

UNIT-1: Introduction

Insurance - purpose and Need - Benefits of Insurance - Functions of Insurance - Importance of Insurance - Principles of Insurance - Nature of Insurance Contract - Types of Insurance Contract - Fundamentals of Insurability - Classification of Insurance.

UNIT-2: Life Insurance

Life Insurance - Definitions of Life Insurance, Advantages of Life Insurance -Fundamental principles of life Insurance - Procedure of taking Life Policy - Meaning of Whole life policy and Endowment policy - Policy conditions, procedure for the settlement of claims - Nomination and assignment - Annuity- Medical policy & Accident Insurance Policy.

UNIT 3: Marine insurance

Marine Insurance - Definition of Marine Insurance contract- Procedure of taking marine policy - Fundamental principles of marine insurance - Warranties in marine insurance - Types of warranties- Types of marine policies, Marine policy conditions.

UNIT 4: Fire Insurance

Fire Insurance- Definition of Fire Insurance contract - Procedure of taking fire policy -Fundamental principles of fire insurance - Types of fire insurance policies - Policy conditions - Implied express conditions.

UNIT 5: E-insurance in India

The Insurance Regulatory and Development Authority (IRDA) – Benefits of e- insurancechallenges of e- insurance- Problems with e-insurance policies and how to deal with them-Companies are providing e-insurance programs - IRDA guidelines for e-insurance policies.

TEXT BOOKS

S.NO	AUTHORS	TITLE
1.	Dr. A.Murthy	Element of Insurance

PUBLISHERS Margham Publisation

2.	E.Gordon and	Banking and Insurance	Himalaya
	P.K.Gupta		Publishing house
3.	P.K.Gupta,	Legal Aspects of Insurance	Himalaya
			Publishing house
4.	Dr.Sunil kumar	Banking and insurance	Calcotia
			Publishing
			Company
5.		https://business.mapsofindia.com/articles/e-	
		insurance-in-india-policy-and-	
		procedures.html	

REFERENCE BOOKS

S.NO	AUTHORS	TITLE	PUBLISHERS
1.	M.N.Mishra and	Insurance principles and practice,	S.Chand
	S.B.Mishra		
2.	GauravVarshney	Insurance Law	Lexis Naxis.
3.	Neelam C. Gulati	Banking and Insurance Practices	Excel Books
4.	Dr.Biswa Mohana	Principles of Banking and Insurance	Shree Vinayak
	Jena		Publication.
5.	O.P.Agarwal	Banking and Insurance	Himalaya
			Publishing House

COURSE OUTCOMES

UNITS	CO STATEMENT	
I Init 1	After studied unit-1, the student will	Understand the basic fundamentals of
Unit	be able to	Insurance
Unit2	After studied unit-2, the student will	Apply the fundamentals of Life Insurance
	be able to	
Unit3	After studied unit-3, the student will	Understand the fundamentals of Life
	be able to	Insurance
Unit4	After studied unit-4, the student will	Apply the fundamentals of Marine
	be able to	Insurance
Unit 5	After studied unit-5, the student will	Understand the procedure of E- insurance
	be able to	

ALLIED – 1 PAPER –1

3. CONSUMERISUM

OBJECTIVES

- 1. To make students to acquire knowledge of consumerism.
- 2. To understand the fundamentals of Consumerism.
- 3. To known the Consumer Protection Act, 1986.
- 4. To acquire the Consumer Protection Act 2006 (Amendments.)
- 5. To gain knowledge Consumer Protection Council.
- 6. To enable the Redressal of consumer grievances.

UNIT – I: Introduction

Consumerism- Concept - Need and Scope of Consumerism- Origin of Consumer Movement – Consumer movement in India- Consumerism in India - Consumer of goods and services - Professional services - Medical, legal, educational and welfare services- Rights and Responsibilities of Consumerism- Unfair Trade Practices

UNIT – II: Consumer Protection Act, 1986

Consumer Protection Act, 1986 – Objectives – Definition of Terms – complainant, consumer dispute, defect, deficiency in service, service, unfair trade practices, restrictive trade practices - UN guidelines for Consumer Protection. Emergence of new Consumer Movements: Green Consumerism.

UNIT – III: Consumer Protection Act 2006

Consumer Protection Act 2006 (Amendments) – Salient features - Objectives -Definitions of the term: - Consumer – Types of Consumer Appropriate authority – Complainant – Consumer dispute – Restrictive Trade Practice. The various Consumer Rights: - Right to Safety, Right to Information, Right to Choose, Right to be heard – Right against exploitation – Right to Consumer Education

UNIT – IV: Consumer Protection Council

Consumer action groups, consumer resistance, consumer boycotts, lobbying, consumer guidance - Nature and Functions - Role and working of Consumer Voluntary Organisations in Grievance Settlement-Composition and Powers of National Commission, State Commission and District Consumer Forum.

UNIT – V: Consumer redressal

Redressal of consumer grievances-Goods & Services covered under Consumer Protection Act-Procedure for filing of complaints with District Forum, State Commission , National Commission.

TEXT BOOKS

S.NO	AUTHORS	TITLE	PUBLISHERS
1.	Dr. Rega Surya	Lecture on Torts and Consumer	Asia Law House,
	Rao	Protection Laws	Hyderabad.
2.	Prof. Rakesh	Consumer Protection Laws	Central – Law
	Khanna		Agency.
3.		Consumer Protection (Amendment) Act,	S. Chand &
		2002.	Sons.2012.

REFERENCE BOOKS

S.NO	AUTHORS	TITLE	PUBLISHERS
1.	Dr. V.K. Agarwal	Consumer Protection (Law & Practice)	Bharat Law House
			Pvt. Ltd.
2.	H.D. Pithawalla, c.	The Consumer Protection Act 2019	
	Jamnadas & co		
3.	Avtar Singh	Consumer Protection (Law & Practice)	Eastern Book Co.

COURSE OUTCOMES

UNITS CO STATEMENT

Unit 1	After studied unit-1, the student will	Understand the basic fundamentals of
Unit	be able to	Consumerism
Unit2	After studied unit-2, the student will	Apply the fundamentals Consumer
	be able to	Protection Act
Unit3	After studied unit-3, the student will	Understand the Amendments of
	be able to	Consumer Protection Act
Unit4	After studied unit-4, the student will	Apply the fundamentals Consumer
	be able to	Protection Council
Unit 5	After studied unit-5, the student will	Understand the procedure of Consumer
	be able to	Redressal

SEMESTER II

CORE THEORY PAPER – 3

FINANCIAL ACCOUNTING II

OBJECTIVES

- 1. To gain knowledge about the different systems of Accounting
- 2. To understand the branch accounts and its types
- 3. To have practical knowledge in the preparation departmental accounting
- 4. To draft the Hire purchase and Installment purchase systems
- 5. To acquire practical knowledge in Partnership accounts
- 6. To gain expertise in preparation of Tally -ERP

UNIT-I Branch accounts

Meaning – objects of branch accounts – accounting in respect of dependent branches: debtors system; stock and debtors system; wholesale branch system and final accounts system - Independent branches – incorporation of branch trial balance in head office books

UNIT – II: Departmental Accounting

Meaning of departments and departmental accounting – Distinction between departments and branches- need for departmental accounting – advantages of departmental accounting - Apportionment of indirect expenses – Inter departmental transfers at cost and selling price - preparation of departmental trading, profit & loss account and balance sheet.

UNIT - III: Hire purchase and Installment purchase systems

Meaning and features of hire purchase system - calculation of interest – books of hire purchaser and books of hire vendor - default and repossession (Hire purchase trading account excluded) Meaning of instalment system -distinction between hire purchase system and instalment system - calculation of interest – books of buyer and books of seller.

UNIT - IV: Partnership accounts

Introduction- Admission of a partner – Retirement of a partner – Death of a partner – treatment of goodwill as per AS 10- Dissolution of a firm – insolvency of a partner (Garner Vs Murray rule) – Insolvency of all the partners

UNIT - V: Basics of Tally:

ERP - Introduction to ERP 9 Advantages and Salient Features of Tally.ERP 9 - Company Creation Ledger Creation with predefined Primary Groups, Predefined Sub Groups and New Sub Groups

TEXT BOOKS:

S.NO	AUTHORS	TITLE	PUBLISHERS

1.	T.S. Reddy & Dr.	Financial Accounting	MarghamPublications,
	A.Murthy,		Chennai.
2.	Jain &Narang,	Financial Accounting	Kalyani Publishers
3.	S.N. Maheshwari	Financial Accounting	S.Chand

REFERENCES BOOKS:

S.NO	AUTHORS	TITLE	PUBLISHERS
1.	Hanif and Mukherjee	Financial Accounting	McGrawhill.
2.	Murugadoss, Jaya, Charulatha and Baskar	Financial Accounting	Vijay Nicholes Imprint Pvt. Ltd.,
3.	Shukla & Grewal	Advanced Accounting	S.Chand & Co.
4.	Parthasarathy.S. & Jaffarulla	FinancialAccounting	KalyaniPublishers, NewDelhi
5.	Gupta, R.L & Gupta V.K	Advanced Accounting	Sulthan chand and sons
6.	AshokSehgal &Deepak Sehgal	Fundamental of Financial Accounting	Taxman Publication
7.	Tulsian	Financial Accounting	Pearson

COURSE OUTCOMES

UNITS CO STATEMENT

Unit1	After studied unit-1, the student will	Understand the basic fundamentals of branch accounting
Unit2	After studied unit-2, the student will	Understand the basic fundamentals of
	be able to	Departmental accounting
Unit3	After studied unit-3, the student will	Understand the Hire purchase and
	be able to	Installment System of accounting
Unit4	After studied unit-4, the student will	Prepare the accounts partnership
	be able to	
Unit 5	After studied unit-5, the student will	Understand the basics of Tally
	be able to	Accounting

CORE THEORY PAPER – 4

OFFICE MANAGEMENT

OBJECTIVE

Understand the range of responsibilities and skills required by the office manager

- 1. Apply various approaches when dealing with the management of tasks, teams and individuals
- 2. Apply techniques to plan and manage workload effectively and achieve objectives
- 3. Create and apply a checklist of systems and procedures to aid the smooth running of the office
- 4. Apply assertive communication and problem-solving skills

UNIT-I

Meaning and Scope -Function and Qualifications of Office Manager -Poor and Good Organization Departments -Flow of Work -Organization Charts and manual.

UNIT-II

Administrative arrangements and physical conditions - Centralization and Decentralization of Office services - Office Accommodation and Layout -Office Furniture - Meaning of Various terms - Basic pattern of work -Sub-division - Standardization and Standards - Work Measurement and control

UNIT-III

Office equipments - Reproduction equipments - Typewriter - Duplicators - Photo Copier -Franking Machine - Communication Equipments - Dictaphone - Intercom - Telephone -Telex - Tele printers - PABX - PBX - STD - Storage equipment - Filling Cabinets - Time Clocks - Use of Computers in Office Management

Office System - Procedure - Routine - And methods - Paper work in office Filling functions - essentials of good filling systems - Central vs. Departmental Filling classification - Methods of filling Old and Modern - Micro filing - Indexing Types.

UNIT-IV

Mail service and communication - Office Correspondence - Central vs. Departmental Correspondence - Handling Mail - Postal Services - Postbag and Post Box Numbers -

Registered and Insured Posts - VPP Communications - Oral written - Internal and external communication - Records Management Types - Forms Controls - Principles - Foremost - Continuous stationery

UNIT-V

Office Supervisor - Meaning and characteristics of Supervisor - Status - Place and Role of Supervisor - Effective Supervisor - Qualification - Knowledge and skill of Supervisor.

Note: Questions in Sec. A, B & C - 100 % Theory.

TEXT BOOKS:

S.NO	AUTHORS	TITLE	PUBLISHERS
1	R.S.N.Pillai & Bhagwathi. V	Office Management	S.Chand, New Delhi.
2.	Arora S.P	Office Management	Vikas Publications Pvt. Ltd., Chennai.

REFERENCE BOOKS:

S.NO	AUTHORS	TITLE	PUBLISHERS	
1.	Balachandiran.V &	Office Management	Vijay Nicole imprints	
	Chandrasekaran		Private Limited,	
			Chennai	

REFERENCE JOURNALS

- 1. Journal of Accounting & Marketing
- 2. Journal of Business & Financial Affairs
- 3. Journal of Defense Studies and Resource Management
- 4. Journal of Entrepreneurship & Organization Management

E-MATERIALS

- 1. Office management
- 2. Elements Of Office Management
- 3. office management skills
- 4. Business organization and office management

COURSE OUTCOMES

UNITS

CO STATEMENT

Unit1	After studied unit-1, the student will	To gain knowledge about nature and	b
	be able to	scope of organization.	
Unit2	After studied unit-2, the student will	To gain effective knowledge abou	ıt

	be able to	Administrative	arrangements	and
		physical conditio	ons	
Unit3	After studied unit-3, the student will	To gain a	knowledge of	Office
	be able to	equipments and (Office System	
Unit4	After studied unit-4, the student will	To know about	Office Correspon	ndence
	be able to			
Unit 5	After studied unit-5, the student will	To learn about O	ffice Supervisor	
	be able to			

ALLIED – 1 (To choose any 1 out of the given 3) PAPER –2

1. INDIAN ECONOMY - II

Course Objectives:

1. To acquire sufficient knowledge about India's Economic Development and fundamental Concept about National Income in India.

- 2. The knowledge acquired through this paper will help the students to know the current changes towards economic development.
- 3. To equip the students to enhance their knowledge about the economic progress and problems of our country.

4. To impart the knowhow of planning and its methodologies.

5. To understand the importance of logistics and movement of people through various transport system.

6. To bring awareness on Information Technology and its impact on Economic Development.

UNIT: I National Income

National Income – Definitions – Concepts – Methods of measuring National Income – Difficulties in the Measurement of National Income – Trends in National Income Growth and Structure – Limitations of National Income estimation in India.

UNIT: II Planning

Planning in India – Objectives – Importance – Evaluation of Economic Planning – Strategy of India's development Plan's – Regional Planning in India –Assessment of Indian Planning – Establishment of NITI Aayog and its functions.

UNIT: III Economic Reforms and Liberalisation

Economic Reforms since 1990's – Appraisal of Economic Reforms – Liberalization: Meaning – Advantages and Disadvantages – Privatization: Meaning and Scope – Globalization – its impact on Indian Economy – Merits and Demerits of Globalization.

UNIT: IV Transport System in India

Transport – Importance of Transport (Roadway, Railways, Shipping and Civil Aviations) to Economic Development – Evaluation of Government in Policy in relation to privatisation policy - Transport Coordination.

UNIT: V Information Technology

Role of Technology - Information Technology BPO in India - their impact on Economic Development – Cyber Crime.

Text Books

Unit-I: Sankaran.S Indian Economy Margham Publications 7th edition 2014

Unit-II: Ruddar Dutt& Sundaram Indian Economy KPN Sulan Chand Publishing 7thedition 2016

Unit-III: Sankaran.S Indian Economy Margham Publications 7th edition 2014

Unit-IV: Sankaran.S Indian Economy Margham Publications 7th edition 2014

Unit-V:Sankaran.S Indian Economy Margham Publications 7th edition 2014

Reference Books:

S.No	Title	Authour	Publisher	Edition	Year
1.	Indian Economy	RuddarDutt&	S.Chand	7^{TH}	2016
		Sundaram KPM	Publishing		
2.	Indian Economy	Sankaran S	Margham	$7^{\rm th}$	2014
			Publications		
3.	Indian Economy	Dhingra I.C	Manakin Press	21^{ST}	2013
4.	Indian Economy	Misra S.K	Himalaya	35 TH	2017
		&PuriV.K	Publishing House		
5.	Indian Economy	Sanjiv Verma	Unique Publishers	8 th	2019
6.	Indian Economy	Agarwal A.N	New Age	41 ST	2016
7.	Economics of	Jhingan M.L	Vrinda Publication	41 ST	2016
	Development &				
	Planning				

E- Materials

- 1. www.studydhaba.com/indian-economy-study-material-pdf
- 2. www.examrace.com/IEcoS/IEcoS-Study-Material
- 3. www.winmeen.com/tnpsc-indian-economy-study-materials
- 4. www.jagranjosh.com/articles/ias-prelims-2015-gs...
- 5. www.examrace.com/NTA-UGC-NET/NTA-UGC-NET-Study...
- 6. www.governmentexams.co.in/tnpsc-indian-economy-notes
- 7. www.tnpscshouters.com/2019/02/tnpsc-indian...

Course Out Comes

1. After studied unit-1, the student will be able to understand the formation of National Income.

2. After studied unit-2, the student will be able to acquire knowledge about the planning in India.

3. After studied unit-3, the student will be able to clarify the economic reforms and LPG policy.

4. After studied unit-4, the student will be able to understand the transport system and policy in India.

5. After studied unit-5, the student will be able to understand the information technology in India.

ALLIED – 1 PAPER –2

2. MERCHANT BANKING

OBJECTIVE

To enable the students to understand Merchant banking and its services to corporate sector.

- 1. To familiarize the students with the concepts of Financial Management
- 2. Managing investment in primary market and secondary market
- 3. To acquaint the students in respect to the investment decisions related to Derivative market.
- 4. Establishing appropriate investment objectives, developing optimal portfolio strategies, estimating risk-return tradeoffs, evaluating investment performance and portfolio revision technique

UNIT-I

Merchant Banking – Definitions and Functions – Regulatory Framework – Registration of Merchant Bankers – Procedure Capital Adequacy Requirement – Lead Merchant Banker Appointment, Restrictions and Responsibilities.

UNIT-II

Public Issue Management – Functions and Mechanism – Categories of Issue – Issue Manager – Category and Restrictions Activities Involved in Public Issue Management – Marketing of New Issues – Methods – Pricing of Rights and Other Public Issues.

UNIT-III

Post Issue Management – Allotment / Dispatch of Shares / Refunds – Basis of Allotment – Procedure – Listing Requirements of Stock Exchanges – Advantages – Listing Requirements of OTCEI.

UNIT-IV

Capital Market Instruments – Meaning and Types – Commercial Paper – Issue of Commercial Paper – Usance – E-nomination – Ceiling – Mode of Issue – Credit Syndication – For Long Term and Working Capital.

UNIT-V

Port Folio Management – Functions – Registration of Port-folio Managers – Obligation – Investment of Client Funds – Maintenance of Book and Accounts – Reports to be Furnished – Code of Conduct. Note: Questions in Sec. A, B & C - 100 % Theory.

TEXT BOOKS:

S.NO	AUTHORS	TITLE				PUBLISHE	RS
1	Dr.S.Gurusamy	Merchant	Banking		Vijay Nicholes Imprint Pvt. Ltd., Chennai		
2.	Dr.V.Balu	Merchant Services	Banking	&	Finance	Sri Publication,	Venkateswara Chennai

REFERENCE BOOKS:

S.NO	AUTHORS	TITLE	PUBLISHERS
1.	H.R. Machiraju	Merchant Banking	New Age
			International, New
			Delhi
2.	Dr. J.C.Verma	A Manual of Merchant Banking	Baharat Law House,
			New Delhi.

JOURNALS

- Merchant banking India: Recent development in merchant banking (2016),ISSN-2455-6602.
- 2. Performance evaluation of merchant banking in India-A study of SBI capital market limited (2015), ISSN-2347-9671.
- Recent development in merchant banking and challenges ahead in India,(2016), E-ISSN:2455-295X.
- 4. A literature review of merchant banking in india (2019), ISSN-2349-5162.
- 5. <u>https://www.businessmanagementideas.com/financial-management/merchantbanking/top-</u> 7-developments-in-merchant-banking-establishment-in-india/4174

E-MATERIALS

- 1. "Business Finance and Financial Management". UpFina. Retrieved 2015-11-04.
- 2. "Capital Structure Definition | Investopedia". Investopedia. Retrieved 2015-11-04.
- 3. 'Nobanee, Haitham; Abraham, Jaya (2015). "Current assets management of small enterprises". Journal of Economic Studie.
- 4. "What are fixed assets? | The e-conomic Accounting Glossary". www.e-conomic.co.uk. Retrieved 2015-11-04.

- "Current Asset Definition AccountingTools". www.accountingtools.com. Retrieved 2015-11-04.
- 6. "The Top 4 Cash Flow Forecasting Mistakes". Entrepreneur. Retrieved 2015-11-04.

COURSE OUTCOMES

UNITS CO STATEMENT

Unit1	After studied unit-1, the student will be able to	To gain knowledge about Merchant Banking				
Unit2	After studied unit-2, the student will	To impart effective knowledge about				
	be able to	Public Issue Management.				
Unit3	After studied unit-3, the student will	To learn about Post Issue Management.				
	be able to					
Unit4	After studied unit-4, the student will	To gain knowledge about Capital Market				
	be able to	Instruments.				
Unit 5	After studied unit-5, the student will	To learn about Port Folio Management.				
	be able to					

ALLIED – 1 PAPER –2

3. BUSINESS MATHEMATICS

Course Objectives

1. To develop skills in sets and operation on sets.

2. How to solve simultaneous equations using matrices.

3. To measure the Simple and compound interests as well as annuities in business.

4. Students get familiarizeon Discount on Bills-Present value, Bankers Discount- Profit and Loss, Roll, wages, overtime Gross salary.

5. To find maxima and minima - applications in businessproblemsusing differentiations.

UNIT-I

Sets: Finite and infinite sets - equality of sets - Disjoint sets - universal set - setoperation Union of sets, intersection of sets - difference of sets - complement of sets -venn diagram -De-Morgan's law - Cartesian product.

UNIT-II

Matrices - type of matrices - matrix operation - Determinant of matrix - Singularand Non Singular matrices - adjoint, inverse of matrix - solving simultaneous linearequations - matrix inversion method and method of reduction.

UNIT-III

Mathematics for Finance - Simple and Compound Interest - Annuities, present value of intermediate, deferred and perpetuity

UNIT-IV

Discount on Bills-Present value, Bankers Discount- Profit and Loss, Roll, wages, overtime Gross salary

UNIT-V

Differentiations - limits - derivatives of standard function x^n , e^x , $log_extrigonometric functions$ - Rules of Differentiation - Differentiation on different types offunctions - successive Differentiation - maxima and minima - applications in businessproblems.

Note: The proportion between theory and problems shall be 20:80

Reference Books:

- 1. P.R. Vittal, Business Mathematics & Statistics, Margham Publishers, Chennai.
- 2. S.P.Gupta, Statistical Methods, S.Chand& Co.,
- 3. Chandran&Agarwal, Business Mathematics.
- 4. Raghavachari, Mathematics for Management,
- 5. Raja Gopalan and Sattinathan, Business Mathematics, Vijay Nicole Publications,

Chennai.

Course Out Comes

Units CO Statement

Unit1 After studing unit-1, the student will be able to Acquired skills in sets and operation on sets.

Unit2 After studing unit-2, the student will be able to measure the Simple and compound interests as well as annuities in business.

Unit3 After studing unit-3, the student will be able tosolve problems Discount on Bills-Present value, Bankers Discount- Profit and Loss, Roll, wages, overtime Gross salary. Unit4 After studing unit-4, the student will be able to Get familiarized on Discount on Bills-Present value, Bankers Discount- Profit and Loss, Roll, wages, overtime Gross salary. Unit 5 Afterstuding unit-5, the student will be able to find maxima and minima - applications in business problemsusing differentiations.

ANNAMALAI UNIVERSITY

MASTER OF COMMERCE

SYLLABUS

UNDER CBCS

(With effect from 2020-2021)

The Course of Study and the Scheme of Examination

Sl.	Study Components Course Title		ins. hrs / week	Credit	Title of the Daney	Maximum Marks						
No.					The of the Paper	CLA	Uni.					
SEMESTER I						CIA	Exam	Total				
1		Paper- 1	6	4	Advanced Financial Management	25	75	100				
2	Core	Paper- 2	6	4	Accounting for Managerial Decision	25	75	100				
3		Paper- 3	6	4	Marketing Management	25	75	100				
4		Paper- 4	6	4	Advanced Business Statistics	25	75	100				
	Internal Elective for same major students											
		Paper-1			(To choose one out of 3)		75	100				
5	Core		2	3 3	A. Business Environment	25						
5	Elective		5		B. Computer Application in Business							
					C. Managerial Economics							
	E	xternal Elec	ctive for o	other majo	or students (Inter/multi disciplinary pape	rs)						
6	Open Elective	Paper-1		3	(To choose one out of 3)	25	75	100				
			3		A. Principles of Marketing							
					B. Elements of Insurance							
					C. Corporate Social Responsibility							
			30	22		150	450	600				
SEMESTER II						CIA	Uni. Exam	Total				
7		Paper- 5	6	4	Corporate Laws	25	75	100				
8	Core	Paper- 6	6	4	Human Resource Management	25	75	100				
9		Paper- 7	6	4	Advanced Corporate Accounting	25	75	100				
	Internal Elective for same major students											
10	Core Elective	Paper-2	5	3	(To choose one out of 3)A. Export and Import ManagementB. Global MarketingC. E-Commerce	25	75	100				

	External Elective for other major students (Inter/multi disciplinary papers)									
11	Open Elective	Paper-2	5	3	(To choose one out of 3)25A. Principles of Management25B. Elements of Accounting25C. Elements of Business Law		75	100		
12	*Field Study		-	2		100	-	100		
13	Compulsory Paper		2	2	Human Rights	25	75	100		
			30	22		250	450	700		

* Field Study

There will be field study which is compulsory in the first semester of all PG courses with 2 Credits. This field study should be related to the subject concerned with social impact. Field and topic should be registered by the students in the first Semester of their study along with the name of a mentor before the end of the month of August. The report with problem identification and proposed solution should be written in not less than 25 pages in a standard format and it should be submitted at the Second Semester. The period for undergoing the field study is 30 hours beyond the instructional hours of the respective programme. Students shall consult their mentors with in campus and experts outside the campus for selecting the field and topic of the field study. The following members may be nominated for confirm the topic and evaluating the field study report.

- (i) Head of the respective department
- (ii) Mentor
- (iii) One faculty from other department

ANNAMALAI UNIVERSITY

MASTER OF COMMERCE

SYLLABUS

UNDER CBCS

(2021-22)

SEMESTER-I

PAPER - 1

ADVANCED FINANCIAL MANAGEMENT

Course Objectives

1. To have the understanding of the functions of finance management

2. To expand the awareness of long term sources of funds.

3. To facilitate the students to the understanding of capital structure and leverage

4. To bring subject knowledge about capital investment decision among the students.

5. To let students to be acquainted with the subject of working capital management.

UNIT-I

Financial Management - Functions - Goals of Financial Management - Maximization Vs. optimizations - Risk-return trade off.

UNIT-II

Management of funds - Long term sources - shares and Debentures - Convertible securities and Term Loans - Working Capital financing - Sources and approaches- Bank credit-Basic principles and methods of assessment- Other sources of short term finance Operating environment of working capital

UNIT-III

Capital structure planning: Concepts of cost of capital - cost of equity, debt, retained earning -Weighted average cost of capital - Capital structure theories - Net income, Net operating income, MM and Traditional Theories - Leverage - Types and significance. Dividend policy and practices - Dividend policies - Factors affecting dividend decision - Dividend theories - Graham, Gordon, Walter and MM Theories.

UNIT-IV

Management of fixed assets - Evaluation of capital investment decision: Payback period - ARR - IRR - NPV - CAPM.

UNIT-V

Working capital management-working capital cycle-forecasting of working capital requirements-Factors influencing working capital-Management of inventory, cash and accounts receivablespayables management-credit and collection policies.

Note: The proportion between Theory and Problems shall be 40:60

Text Books

1. I M Pandey, Financial Management, Vikas Publishing House Pvt Ltd.

2. John H Hampton, Financial Decision Making, Prentice Hall of India Ltd.

Reference Books

1. Prasanna Chandra, Financial Management, Tata McGraw Hill Publishing Company Limited.

2. M.Y.Khan and P.K.Jain, Financial Management, Tata McGraw Hill Publishing Company Limited.

3. P.V.Ratnam, Financial Management Theory, Problems and Solutions, Kitab Mahal.

Course Outcomes:

- 1. After studied Unit-1, the student will be able to understand the functions of finance Management.
- 2. After studied Unit-2, the student will be able to know about the long term sources of funds and environment of working capital.
- 3. After studied Unit-3, the student will be able to gain information about capital structure and leverage
- 4. After studied Unit-4, the student will be able to gain knowledge about capital investment decision
- 5. After studied Unit-5, the student will be able to be acquainted with on the subject of working capital Management.

PAPER - 2

ACCOUNTING FOR MANAGERIAL DECISION

Course Objectives

- 1. To enhance the understanding of the Accounting for Decision making
- 2. To extend the knowledge of Ratio Analysis.
- 3. To facilitate the students to have the deep understanding financial statements
- 4. To bring about the awareness of Cost Management.
- 5. To let students to know about financial decisions and capital structure

UNIT-I

Accounting for Decision making - Scope and Importance - Decision Accounting vs. Financial Accounting and Cost Accounting.

UNIT-II

Financial and Investment analysis - Analysis and Interpretation - Ratio Analysis Leverage analysis-Budgeting and budgetary control - Functional Budgets- Master Budget - Flexible budgeting - Zero Base Budgeting

UNIT-III

Understanding Financial statements-Construction and analysis of profit and loss account and balance sheet-Construction and analysis of Fund flow and cash flow statements.

UNIT-IV

Cost Management- Absorption and Marginal Costing - Cost - volume-profit analysis Applications and techniques.

UNIT-V

Financial decisions-capital structure-dividend decisions (only simple problems).

Note: 80% of the total marks be allotted for problems and 20% for theory

Text Book

1.Management Accounting and Financial Control - S.N.Maheswari, Sultan Chand & sons, New Delhi

Reference books

- 1. Management Accounting Man Mohan and Goyal.
- 2. Management Accounting Hingorani and Ramanathan.
- 3. Management Accounting Charles Horngren.
- 4. Management Accounting J.Batty.
- 1. After studied Unit-1, the student will be able to understand the concept of Accounting for Decision making
- 2. After studied Unit-2, the student will be able to understand the Ratio Analysis Leverage analysis-Budgeting and budgetary control
- 3. After studied Unit-3, the student will be able to understand the analysis of Fund flow and cash flow statements
- 4. After studied Unit-4, the student will be aware of the Marginal Costing, Applications and its technique
- 5. After studied Unit-5, the student will be able to know Financial decisions Making

PAPER - 3

MARKETING MANAGEMENT

Course Objectives

- 1. To enhance the understanding of Core Marketing and Marketing segments and targets.
- 2. To extend the knowledge of marketing mix and brand equity.
- 3. To facilitate the students to have the deep understanding of Marketing Channels and Value networks and Market Logistics.
- 4. To bring about the awareness of marketing promotion and role of marketing communication in advertisement.
- 5. To let students to know about recent trends in modern marketing

UNIT I: Introduction

Marketing: Definition, importance and scope – Core marketing concepts – Functions of Marketing. Consumer Buying Motives - Customer Value, Customer Relationship Management-Significance - Identifying Market Segments and targets.

UNIT II: Marketing Mix – Product & Pricing

Marketing Mix - Product – Definition - characteristics and classifications - New Product Development – Product Life Cycle Management – Product Vs Services. Packaging and Labeling - Brand Equity – Measuring Brand Equity. Pricing - Objectives - Pricing Strategies -. Factors affecting price of a product- Ethical issues in pricing decisions.

UNIT III: Marketing Mix - Physical Distribution

Physical distribution: Marketing Channels and Value Networks – Role of Marketing Channels – Channel design decisions – Middlemen in Distribution – Functions of Wholesalers – Retailers. Elimination of Middlemen - Modern Retailing Practices – Classifications. Market Logistics – Objectives.

UNIT IV: Marketing Mix - Promotion:

Promotion: Role of Marketing Communication - Communication Mix – Advertising – Kinds of Media – Planning an Advertising Campaign, Personal Selling - Qualities of a Good Salesman, Sales Promotion – Strategies, Public relations – Functions and Types .

UNIT V: Recent Trends in Modern Marketing

Direct Marketing – Features – Benefits- Types. Impact of Digital Marketing on Businesses. Building Word-of-Mouth Marketing Strategy - Importance of Socially Responsible Marketing. Elements of Green Marketing. Cyber Marketing – Nature - Limitations

Text Book:

1 Philip Kotler, Kevin Lane Keller, Abraham Koshy and Mithileswar Jha. 2017. Marketing

Management. [Thirteenth Edition]. Pearson Education, New Delhi.Reference Books:

2 Ramaswamy, V.S and Namakumari S, 2009. Marketing Management. [Third Edition]. Macmillan India Ltd, New Delhi.

3 Rajan Saxena. 2009. Marketing Management. [Fourth Edition]. Tata-McGraw Hill, New Delhi.

Course Outcome

1. The students will able to know the core market and their functions.

2. The students will able to know the various kinds of Pricing and various stages in product life cycle, new product development.

3. The students will gain knowledge about the marketing channel and distribution.

4. The students will learn about the kinds of advertisement and qualities of good salesman.

5. The Student will know about the recent trend in modern marketing and digital marketing.

PAPER - 4

ADVANCED BUSINESS STATISTICS

Course Objectives

1. To enhance the understanding of multiple correlation and multiple regression

2. To extend the knowledge of technique of probability.

3. To facilitate the students to have the deep knowledge on Sampling methods, proportions-large and small samples- Z test and T test

4. To bring about students to get information about chi square test.

5. To let students to know about F-Test and ANOVA.

Unit-I

Partial correlation-Partial correlation coefficient-Partial correlation in case of four variables-Multiple correlation -Multiple regression.

Unit-II

Theory of profitability-probability rules-Bayes theorem-Probability distribution-Characteristics and application of Binomial, poission and normal distribution.

Unit-III

Sampling- sampling methods- sampling error and standard error- relationship between sample size and standard error. Testing hypothesis- testing of means and proportions-large and small samples- Z test and T test.

Unit-IV

Chi square distribution- Characteristics and application- test of goodness of fit and test of independence- Test of Homogeneity.

Unit-V

F distribution- testing equality of population variances- Analysis of variance- one way and two way classification.

Note: The proportion between theory and problems shall be 20:80

Text Books:

- 1. S P Gupta, Statistical methods, Sultan chand& Sons 2000, New Delhi
- 2. D C Samcheri and V K Kapoor, Business statistics, Sultan Chand and sons, New Delhi

Reference Books

- 1. J.K.Sharma, Business Statistics- Pearson Education
- 2. Richard I Levin and David S. Rubit, Statistics for management, 7th Edition, Pearson education, New Delhi, 2002
- 3. Business statistics and operations research, Dr D Joseph Anbarasu, Lintech press Trichy

- 1. After Studied Unit-1, The Student Will Be Able To Know Partial And Multiple Correlations.
- 2. After Studied Unit-2, The Student Will Be Able To Know Probability And Binomial Distribution.
- 3. After Studied Unit-3, The Students will know the Issues Surrounding Sampling, Hypothesis, Z Test and T Test.
- 4. After Studied Unit-4, The Student Will Be Able To Have The Awareness About Application Of Chi- Square Distribution.
- 5. After Studied Unit-5, The Student Will Be Able To Know About Analysis Of Variance And F Test.

CORE ELECTIVE

PAPER 1

(TO CHOOSE ANY 1 OUT OF THE GIVEN 3)

A. BUSINESS ENVIRONMENT

Course Objective

- 1. To understand the concepts of Business Environment.
- 2. To identify the Social Responsibility of Business to different stakeholders
- 3. To understand How Economic Environment in Industrial Development Policies -
- Industrial policy, Fiscal policy, Monetary policy, Economic Reforms in India 4. To understand the Socio-Cultural Environment.
- 5. To familiarize with the Technological Environment and Modernisation of Technology.

UNIT - I : Theoretical Framework of Business Environment

Business Environment: Concept, significance and nature of business environment; Elements of environment – internal and external; Changing dimensions of business environment; Techniques of environmental scanning and monitoring. PEST and SWOT analysis

UNIT - II: Economic Environment of Business

Economic Environment: Significance and Elements of Economic Environment; Economic systems and business environment; Economic Planning in India; Industrial Development Policies - Industrial policy, Fiscal policy, Monetary policy. Economic Reforms in India - Liberalisation and impact of Globalisation. Impact of Rupee Devaluation and Demonetization

UNIT-III : Political and Legal Environment

Political and Legal Environment: Elements of political environment; Government and Business; Changing Dimensions of Legal Environment in India – Classification of Laws Influencing Business, Competition Act, Consumerism in India - Consumer Protection Act. - Objectives of GST. Significance of Corporate Governance – Need of Environmental Protection.

UNIT-IV : Socio-Cultural Environment

Business and Society – Objective of Business. Components of Socio-cultural environment; Social institutions and systems; Elements of Culture - Social Values and Attitudes;. Social Responsibility of Business – Guidelines. Ethical Principles in Business. Code of Ethics.

UNIT-V: Technological Environment

Technological Environment: Factors governing Technological Environment-Impact. Innovation - Technology Transfer – Modernisation -Factors to be Considered for Appropriate Technology. Incentives and Concessions for Technological Research - Productivity in Indian Industry -Intellectual Property Rights.

Text Books

- 1. Francis Cherunila: Business Environment Himalaya Publishing House, Bombay.
- 2. C.B.Gupta: Business Environment, Sultan Chand and Sons, New Delhi

Reference Book

- 1. Adhikary, M: Economic Environment of Business, Sultan Chand & Sons, New Delhi.
- 2. Aswathappa,K.Legal Environment of Business, Himalaya Publication, New Delhi.
- 3. Chakravarty, S: Development Planning, Oxford University Press, Delhi.

- 1. The students will able to learn Theoretical Framework of Business Environment.
- 2. The students will able to make the student knowledge about business Economic Environment of Business.
- 3. The students will able to Familiarize Current Political and Legal Environment.
- 4. The students will able to understand the Socio Cultural Environment and Ethics.
- 5. The students will able to learn the Latest Technology Environment for Business.

CORE ELECTIVE

PAPER 1

B. COMPUTER APPLICATION IN BUSINESS

Course Objectives

1. To make the students to understand the basic concepts of Computers and Computer hardware.

- 2. To expand the understanding of information Technology
- 3. To facilitate the students to have insights on words processing
- 4. To know how to present the business documents using Excel Sheet
- 5. To let to know students to Power Point presentation using various Transitions.

UNIT-I : COMPUTER HARDWARE

CPU, Input devices, Output Devices, Communication devices, storage devices Types of computer system.

UNIT-II: INFORMATION TECHNOLOGY

Basic idea of LAN (Local Area Network), and WAN (Wide Area Net work) E-mail: Internet Technologies, Access Devices, Concept of World Wide Web and Internet browsing.

UNIT-III : WORD PROCESSING

Introducing and working with MS Word in MS-Office - Word Basic Commands, formatting - Text and documents, Sorting and Tables, Working with graphics, introduction to Mail merge.

UNIT-IV : SPREAD SHEET

Working with EXCEL - Formatting functions, chart features, working with graphics in EXCEL using worksheets as database in accounting, Marketing, finance and personnel areas.

UNIT-V: PRESENTATION WITH POWER POINT

Power Point, basics creating Presentation of easy way: working with graphics in Power Point show time, sound effect and animation effects.

Text Books

- 1. Mansfield, Ron: The Compact Guide to Micros soft Office BPB Publicaton, New Delhi.
- 2. O.Brian...A: Management information System, Tala Mc Graw Hill, Delhi.
- 3. Ullman, J.O: Principles of Data base System, Galgoia publication, New Delhi

Reference Books:

- 1. Date, C.J: An Introduction to Data base systems, Addison Wesley, Massachusetts.
- 2. Dienes, Sheih.S: Micro soft Office, Professional for Windows 95: Instant Reference: BPB Publication, New Delhi

- 1. After studied Unit-1, the student will be able to understand the various components of a computer system: Storage Devices, Input Devices & Output devices
- 2. After studied Unit-2, the student will be able to develop an idea about World Wide Web and Internet browsing
- 3. After studied Unit-3, the student will be able to know about the Preparation and presentation of business documents using Word Document
- 4. After studied Unit-4, the student will be able to will gain knowledge of about Preparation and presentation of the business documents using Excel Sheet,
- 5. After studied Unit-5, the student will be able to acquire the knowledge about how to Prepare PPT- Power Point presentation using various Transitions, Animations and other layouts.

CORE ELECTIVE

PAPER 1

C. MANAGERIAL ECONOMICS

Course Objectives

1. To make the students to understand the theories of managerial economics and factors.

2. To expand the awareness of Demand analysis and Forecasting

3. To facilitate the students to understand the law of variable proportions, product function and cost function

4. To bring subject knowledge on Economics of size and capacity Utilization and market structure pricing.

5. To let students to be acquainted with the subject of Business cycle and Policies.

UNIT-I

Definition and scope of the subject-fundamental concepts and Methods-firm's objectives and the role of managerial economist.

UNIT-II

Demand analysis and Forecasting for consumer goods and capital goods-use of business indicators- type of elasticity.

UNIT-III

Concept and resources allocation- Cost Analysis- Short run and long run Cost functions production functions- cost price- Output relations.

UNIT-IV

Economics of size and capacity Utilization - Input-Output analysis- Market Structure Pricing and output general equilibrium.

UNIT-V

Pricing Objectives- pricing methods and approaches-price discrimination, Product line pricingprofit planning and Cost control- Business cycle and Policies. .

Text Books:

1. Peterson, managerial economics, 4th edition - Pearson education - New Delhi.

2. Sampat Mokherjie, Business and Managerial Economics, New Central Book Agency, Calcutta.

3. R.L. Varshney & K.L. Maheshwari, Managerial Economics-Sultan Chand & Sons, New Delhi.

Reference Books:

1. Spencer M.H.Managerial Economics Text, Problems and short cases, Richard D.Inwin INC.

- 2. Sankaran.S, Managerial Economics Margham Publications, Chennai.
- 3. Dwivedi D.N, Managerial Economics, Vikas-New Delhi
- 4. Mankar & Denkar, Business Economics, Himalaya publishing House, Bombay
- 5. Joel Dean, Managerial Economics, Prentice Hall of India New Delhi.

- 1. After studied Unit-1, the student will be able understand the theories of managerial economics and factors.
- 2. After studied Unit-2, the student will be able to develop an idea about Demand analysis and Forecasting.
- 3. After studied Unit-3, the student will be able to provide an idea regarding law of variable proportions, product function and cost function.
- 4. After studied Unit-4, the student will be able to make them aware about the Economics of size and capacity Utilization and market structure pricing.
- 5. After studied Unit-5, the student will be able to acquire the knowledge about be Business cycle and Policies

OPEN ELECTIVE

PAPER 1

(TO CHOOSE ANY 1 OUT OF THE GIVEN 3)

A. PRINCIPLES OF MARKETING

Course Objectives

1. To enhance the understanding of the evolution of Marketing

2. To extend the knowledge on Bases of Market Segmentation and factors influencing Consumer Behaviour

3. To facilitate the students to understand the various Elements of Marketing Mix and Product Life Cycle.

4. To bring subject knowledge on kinds of Pricing and types of Channels of Distribution.

5. To let students to know on the subject of Recent trends in Marketing.

Unit - I Introduction

Meaning of market – classification of markets- meaning and definition of marketing features of marketing – importance of marketing – difference between marketing and selling – Evolution of marketing concepts - functions of marketing.

Unit - II Market Segmentation and Consumer Behaviour

Meaning and definition of market segmentation – different patterns of market segmentation – Definition of consumer behaviour - factors determining consumer behaviour.

Unit - III Marketing Mix

Four P's of marketing mix - definition of product - classification of products - stages in new product development - product life cycle.

Unit - IV Pricing policy and Channel of distribution

Factors affecting price decision – Types of pricing strategies - definition of channel of distribution – types of Channel of distribution - factors determining Channel of distribution.

Unit - V Recent trends in Marketing

Social marketing – Demarketing – Remarketing – Over marketing – Meta marketing – E-Marketing – online retailing – shopping malls.

Text Books:

1. Rajan Nair, Marketing, Sultan Chand & Sons , New Delhi

2. Varshney, Marketing Management, Sultan Chand & Sons, New Delhi.

Reference Books:

- 1. Jaisankar, Marketing, Margham Publications, Chennai
- 2. L. Natarajan, Marketing, Margham Publications, Chennai
- 3. Dr. K. Sundar, Essentials of Marketing, Vijay Nicole Imprints Private Ltd., Chennai

- 1. After studied Unit-1, the student will be able to understand the evolution of Marketing across ages through varying views on Marketing concept
 - 2. After studied Unit-2, the student will be able to know the Bases of Market Segmentation and factors determining consumer behaviour
 - 3. After studied Unit-3, the student will be able to know the Significance of Elements of Marketing Mix and Factors affecting price decision
 - 4. After studied Unit-4, the student will be able to know about kinds of Pricing and types of Channels of Distribution
 - 5. After studied Unit-5, the student will be able to know the recent trends in Marketing.

OPEN ELECTIVE

PAPER 1 B. ELEMENTS OF INSURANCE

Course Objectives

1. To impart understanding about the functions, nature and principles of insurance

- 2. To bring understanding on the basics of Life Insurance
- 3. To facilitate knowledge on the principles and kinds of Marine Insurance
- 4. To provide knowledge to the students about computation of claims in respect of Fire Insurance

5. To know about Miscellaneous Insurance and Key players in Indian Insurance Industry

Unit - I: Introduction

Insurance -Meaning, functions, nature and principles of insurance, importance of insurance to Individuals and business - Elements of the insurance contract - Types of insurance contract – Insurance as a tool to manage risk.

Unit - II: Life Insurance

Life Insurance - Features of a life insurance contract - Advantages of Life Assurance - Types of Life Insurance Plans – Claims in Life Insurance - Health Insurance Policies – benefits

Unit - III: General Insurance - Marine Insurance

Marine Insurance - Types of Marine Losses - Contract of marine insurance – Elements of marine insurance – classes of policies – policy conditions – clause in a marine insurance policy.

Unit - IV: General Insurance - Fire Insurance

Fire Insurance - features of a fire insurance - kinds of policies - policy conditions - payment of claims - reinsurance.

Unit - V: General Insurance – Miscellaneous Insurance

Miscellaneous Insurance – Motor insurance – Burglary – Personal accident insurance. Key players in Indian Insurance Industry

Text Books:

Reference Books:

- 1. M. N. Mishra, Insurance Principles And Practice, S. Chand & Co, New Delhi, 2000
- 2. M.N.Mishra, Modern concepts of Insurance, S.Chand&Co
- 3. P.S. Palandi, Insurance in India, Response Books Sagar Publications

- 1. After Studied Unit-1, Students will be able to gain knowledge on functions, nature and principles of insurance
- 2. After Studied Unit-2, Students will be able understand the existence of Life Insurance and learn its benefits
- 3. After studied unit-3, Students will be able to gear up the principles and kinds of Marine Insurance
- 4. After Studied Unit-4, Students will be able to know the usefulness of Fire Insurance to the stakeholders.
- 5. After Studied Unit-5, the student will be able to know the Miscellaneous Insurance policies and Key players in Indian Insurance Industry

OPEN ELECTIVE

PAPER 1 C. CORPORATE SOCIAL RESPONSIBILITY

Course Objectives

- 1. To enhance the understanding of the corporate Social responsibility of Business
- 2. To extend the knowledge of factors influencing CSR policy
- 3. To facilitate the students to have the understanding about benefits of CSR to the company
- 4. To students to know about institutional investors in corporate governance
- 5. To let students to know about corporate governance board and its power.

<u>UNIT I</u>

Corporate social responsibility – Meaning – Definition – scope of CSR– a rational argument of CSR – Economic argument for CSR – strategies of CSR – challenges and implementation of CSR in Indian – relation between CSR and corporate governance – major code of CSR initiative in India – barriers to social responsibility – social responsibility of business.

<u>UNIT II</u>

Designing a CSR policy – factors influencing CSR policy – managing CSR in an organization role of the human resource professional in CSR– global reorganization of CSR – ISO 14000 – SA8000 – AA1000 – codes – formulated by an Global compact – UNDP – global reporting Initiative.

<u>UNIT III</u>

CSR reporting trend in developing countries – timing and mode of release of CSR reports – CSR policy of a multi-product, multi-location Indian MNC's – constitutions of corporate social responsibility – dimensions of CSR – benefits of CSR to the company.

<u>UNIT IV</u>

Corporate governance – concept, structure, process, origin – scope and present scenario – role of institutional investors in corporate governance – structure and development or board – role of capital marketing governance, governance rating future of governance – innovation practices – case studies with lesion learned.

<u>UNIT V</u>

Corporate governance board and its power – responsibility – disqualification, board committee and their functions – remuneration committee – nomination committee, compliance committee – share holder grievance committee – investor relation committee – investment committee – risk management committee – and audit committee – regulatory framework of corporate governance in India; SEBI guidelines and clause 49; reforms in the company act 2013 – corporate governance in PSU; and banks.

Text Book:

- 1. Tandon Bb Vashishi, Ak,Kesho Prasad Arya PP, Corporate Governance Deep and Deep Publication ,New Delhi. 1st Edition.
- 2. S.A.Sherlekar Ethics in Management, Himalaya Publishing House 2009.

Reference books.

- 1. Corporate Social Responsibility In India Sanjay K.Agarwal Sage Publication Ltd UK 2008.
- 2. William B.Werther and David Chandler, Strategic Corporate Social Responsibility, Sage Publication In 2001.
- 3. Mallin Christine A, Corporate Governance (Indian Edition) Oxford University Press, New Delhi.
- 4. Blowfield, Michal and Alan Murray, Corporate Responsibility Oxford University Press, New Delhi.

- 1. After studied Unit-1, the student will be able to acquire the knowledge Corporate Social responsibility of Business
- 2. After studied Unit-2, the student will be able to know the Identify the factors influencing CSR policy and Global Organisation CSR
- 3. After studied Unit-3, the student will be able to have to understanding of benefits of CSR to the company
- 4. After studied Unit-4, the student will be able to know the institutional investors in corporate governance
- 5. After studied Unit-5, the student will be able to know about corporate governance board and its power.

SEMESTER II

PAPER - 5

CORPORATE LAWS

Course Objectives

1. This course is aimed at teaching students various Acts that impact Indian Corporations like Corporate Governance that is essential in today's Business World.

2. This course also deals with provisions of Competition Act, 2000 related to Companies.

3. To educate students with regard to SEBI the listing procedures.

4. To Impart Knowledge about provisions of FEMA Act help Companies that deal in International Trade.

5. Provisions related to Companies in the Insolvency and Bankruptcy Code, 2016 will help the students to understand the process of Insolvency Resolution and Liquidation.

UNIT - I

Corporate Laws – Corporate Personality – Corporate Governance – Concept – Corporate Governance Practices and Codes: Provisions under The Companies Act. – E-Governance

UNIT - II

Competition Act, 2000 – Introduction – Objectives – Important Definitions – Prohibition of Anti-Competitive Agreements – Prohibition of Abuse of Dominant position – Regulation of Combinations – Competition Commission of India – Composition – Duties, Powers and Functions – Penalties – Appellate Tribunal – Procedures & Powers – Powers of the Central Government.

UNIT - III

The Securities and Exchange Board of India Act, 1992 – Introduction – Objectives – Important Definitions – Definitions under Securities Contracts (Regulations) Act, 1956 - Powers and Functions of SEBI – Registration – Penalties – Adjudication – Appellate Tribunal – Appeals – Procedure and Powers of The Securities Appellate Tribunal – Power to make Rules and Regulations – SEBI Issue of Capital and Disclosure Requirements Regulations, 2018 – General conditions for Public Issues and Rights Issues – Conditions for Initial Public Offer – Conditions for Further Public Offer – Pricing - Procedure for Listing of Securities – Conditions for Listing – Types of Listing – Procedure for Listing Requirements – Benefits of Listing – Defects of listing - The SEBI (Prohibition of Insider Trading) Regulations, 2015

UNIT - IV

The Foreign Exchange Management Act, 1999 – Introduction – Objective – Differences and Similarities between FERA and FEMA - Important Definitions under the Act – Provisions related to Regulation and Management of Foreign Exchange – Authorised Person – Offences – Contraventions & Penalties – Adjudication & Appeals – Appellate Tribunal – Directorate of Enforcement

UNIT - V

Insolvency and Bankruptcy Code, 2016 – Introduction – Objectives – Applicability of the Code – Important Definitions – Relationship between Bankruptcy, Insolvency and Liquidation -Corporate Insolvency Resolution Process – Liquidation Process – Fast Track Insolvency Process for Corporate Persons – Voluntary Liquidation – Adjudicating Authority – Offences and Penalties – Insolvency and Bankruptcy Board of India – Insolvency Professional Agencies – Insolvency Professionals – Information Utilities – Powers of Central Government

Text Books:

- 1. J. Jayasankar, Corporate Laws, Margham Publications, Chennai
- 2. Bharat Bhushan, N.D. Kapoor, Dr. Rajni Abbi & Rajiv Kapoor, N.D. Kapoor's Elements of Mercantile Law, Sultan Chand & Sons Pvt. Ltd., New Delhi

Reference Books:

- 1. K. Aswathappa & G. Sudarsana Reddy, Business Regulations, Himalaya Publishing House, Mumbai
- 2. Dr. MR Sreenivasan, Business Law (Commercial Law), Margham Publications, Chennai
- 3. Gulshan, S.S. A Hand book of Corporate Laws, S. Chand & Co, New Delhi

E-Resources:

- 1. The Institute of Chartered Accountants of India's Study Material for Competition Act, 2002: <u>https://resource.cdn.icai.org/47565bosfinal-p6d-cp2.pdf</u>
- The Institute of Chartered Accountants of India's Study Material for The Foreign Exchange Management Act, 1999: <u>https://resource.cdn.icai.org/47681bosfinal-p6dcp6.pdf</u>
- 3. The Institute of Chartered Accountants of India's Study Material for The Insolvency and Bankruptcy Code, 2016: <u>https://resource.cdn.icai.org/47588bosfinal-p6d-cp4.pdf</u>
- 4. The Institute of Cost Accountants of India's Study Notes for Corporate Laws: https://icmai.in/upload/Students/Syllabus2016/Final/Paper-13-Revised-Aug.pdf
- 5. The Competition Act, 2002 Bare Act at India Code Digital Repository: https://indiacode.nic.in/handle/123456789/2010?view_type=browse

- The Securities and Exchange Board of India Act, 1992 Bare Act at India Code Digital Repository: <u>https://indiacode.nic.in/handle/123456789/1890?view_type=search&sam_handle=123</u> 456789/1362
- 7. The Securities and Exchange Board of India Act, 1992 Bare Act at SEBI's Website: <u>https://www.sebi.gov.in/legal/acts/jan-1992/securities-and-exchange-board-of-india-act-1992-as-amended-by-the-finance-no-2-act-2019-3.html</u>
- 8. Securities Contracts (Regulation) Act, 1956 at SEBI's Website: https://www.sebi.gov.in/acts/contractact.pdf
- 9. The Foreign Exchange Management Act, 1999 Bare Act at India Code Digital Repository: <u>https://indiacode.nic.in/handle/123456789/1988?view_type=search&sam_handle=123 456789/1362</u>
- 10. The Insolvency and Bankruptcy Code, 2016 at India Code Digital Repository: https://indiacode.nic.in/handle/123456789/2154?view_type=browse&sam_handle=123 456789/1362

- 1. Define Corporate Personality, Corporate Governance, E-Governance and describe the Corporate Governance Code in Companies Act.
- 2. Discuss the prohibitions of certain Agreements, Abuse of Dominant Position and Regulation of Combinations under The Competition Act.
- 3. Enumerate the Powers and Functions of SEBI.
- 4. Describe the provisions related to listing of Securities, Public Offerings and discuss the prohibition of Insider Trading in various regulations of SEBI
- 5. Discuss the provisions related to Regulation and Management of Foreign Exchange, Related Offences, Penalties and Appeals Procedure under FEMA, 1999.
- 6. Elucidate the Corporate Insolvency Resolution Process and Liquidation Process under Insolvency and Bankruptcy Code, 2016.

PAPER - 6

HUMAN RESOURCE MANAGEMENT

Course Objectives

1. To make students to understand the basic concepts of Human Resource Management.

- 2. To expand the understanding of the Recruitment and Selection Procedure
- 3. To facilitate the students to be thoughtful about the Grievances procedure
- 4. To express to students the methods of Performance Appraisal
- 5. To let to know students about the Techniques of Training.

UNIT-I

HRM- Nature and Scope – Functions of HRM – Functions of HR Manager - development of the human potential - Link between organization planning and HR planning.

UNIT-II

Acquisitions and maintenance of personnel - recruitment and selection - purposes and methods of recruitment and selection - Maintenance of personnel - motivation for increased productivity - $Q \ W \ L$.

UNIT-III

Rewards and incentives - financial and non-financial incentives - Grievance procedure - conflict - process - stress vs. challenge - sources - resolution.

UNIT-IV

Performance appraisal - Ranking, rating scales, critical incident method - MBO as a method of appraisal - Removing subjectivity from evaluation - Criteria for promotions and job enrichment.

UNIT-V

Human development - training - need and importance - methods of training - designing training program - Evaluation of training program - Executive development. - Organization change - change agents - resistance to change - managing the resistance.

Text Books

- 4. Aswathappa, Human Resource and Personnel Management, TataMcGraw Hill, NewDelhi, 2002.
- 5. A.M. Sheikh, Human Resource Development and Management, S. Chand & Co, New Delh

Reference Books:

- 1. Dressler- Human Resource management, 8th Ed. Pearson Education, 2002
- 2. De Cenzo and Robbins, Personnel/Human Resource Management, Prentice Hallof India, 1998.
- 3. S.K.Chakrabothy, Values and Ethics for Organization, Oxford University Press 1999.

Course Outcomes:

1. After studied Unit-1, the student will be able to understand the concepts of Human Resource Management

- 2. After studied Unit-2, the student will be able to understand Recruitment and Selection Procedure
- 3. After studied Unit-3, the student will be able to know the various ways of solving the employee grievances procedure.
- 4. After studied Unit-4, the student will be able to know the evaluation the methods of Performance Appraisal
- 5. After studied Unit-5, the student will be able to evaluate the Different Techniques of Training.

PAPER - 7

ADVANCED CORPORATE ACCOUNTING

Course Objectives

- 1. To enhance the understanding of the accounts of banking companies and final accounts.
- 2. To have the knowledge about IRDA Regulations Regarding the Preparation of Financial Statements.
- 3. To facilitate the students to have the deep understanding of holding company account, Consolidation of balance Sheets and Profit and Loss Accounts
- 4. To know about Inflation accounting
- 5. To let students to know about Human Resource Accounting

UNIT-I

Accounts of Banking Companies - Legal Provisions - Capital Adequacy Norms - Rebate on Bills Discounted - Asset Classification and Provisioning - Preparation of Final accounts.

UNIT-II

Insurance Company Accounts - Nature of Insurance Business - Distinction between Life and Non Life Insurance - Accounts of Life Insurance Business - Accounts of General Insurance Business - IRDA Regulations Regarding Preparation of Financial Statements.

UNIT-III

Holding Company Accounts - Consolidated Financial Statements - Consolidation of balance Sheets and Profit and Loss Accounts.

UNIT-IV

Inflation accounting - Need - Objections - Adjustments for General Price Changes - Current Purchasing Power Accounting (CPP) - CPP method of preparing financial statements.

UNIT-V

Human Resource Accounting - Need and Development - Importance of Human Resource Accounting - Objections against Human Resource Accounting - Human Resource Accounting in India. Corporate Social Reporting - Concept and objectives of social responsibility.

Text Books:

- 1. M.Y.Khan, Indian Financial System, Tata McGraw Hill, 2001.
- 2. H.R.Machiraju, Indian Financial System, Vikas Publishing House, 1999
- 3. B.S. Bhatia &G.S.Bhatre, Management of Capital Markets, Financial Services and Institutions, Deep and Deep Publishers, 2000.

Reference Books:

- 1. Dr. V. Balu, Merchant Banking & Finance Services, Sri Venkateswara Publication, Chennai
- 2. Dr. N. Permavathy, Financial Services and Stock Exchange, Sri Vishnu Publications, Chennai.
- 3. Dr.S.Gurusamy, Financial Services and Systems, Vijay Nicholes Imprint Pvt. Ltd., 2004 Chennai.

- 1. After studied Unit-1, the student will be able to make them aware about the accounts of banking companies.
- 2. After studied Unit-2, the students will gain knowledge on preparation of accounts of insurance companies.
- 3. After studied Unit-3, the students will be able to know develop knowledge of holding company concept & preparation of consolidated balance sheet.
- 4. After studied Unit-4, the student will be able to know about Inflation accounting and CPP method
- 5. After studied Unit-5, the student will be able to know about Human Resource Accounting in India.

CORE ELECTIVE

PAPER 2

A. EXPORT AND IMPORT MANAGEMENT

Course Objectives

- 1. To enhance the understanding of the International Trade and Foreign Trade Policy.
- 2. To extend the knowledge of Balance of Payments and FEMA.
- 3. To facilitate the students to have the deep understanding of Export Procedure and Export Documents.
- 4. To bring about the awareness regarding the Guidelines of Import Procedure.
- 5. To let students to know about Export Pricing, Financing and EXIM Bank.

UNIT-I: INTRODUCTION TO INTERNATIONAL TRADE

Features of International Trade - Differences between International Trade and Domestic Trade - Advantages against International Trade - Free Trade and Protection - Advantages of Free Trade and Protection - Tariffs- Non - Tariff barriers - Quota - Foreign Trade Policy - Incoterms

UNIT- II: BALANCE OF PAYMENTS AND FOREIGN EXCHANGE MANAGEMENT ACT (FEMA)

Definitions of Balance of Payments - uses of Balance of Payments- Differences between balance of trade and balance of payments - Objectives of the FEMA- Administration of the Act - Dealings in foreign exchange - Capital Account Transactions - Exports of Goods and Services

UNIT-III: EXPORT PROCEDURE AND EXPORT DOCUMENTS

Step-by-Step procedure for export - Documents required for Export - Bill of Lading - Airway Bill - Shipping Bill - Documents related to payment - Letter of Credit (LC) - Bill of Exchange - Trade Receipts - Letter of hypothecation - EPCG - Clearing and Forwarding Agents - Logistic Management - Supply Chain

UNIT- IV: GUIDELINES AND IMPORT PROCEDURE

Introduction - Procedure for Import - Duties at the time of import - Duty Calculation - Changes in import Procedure - Import under Export Promotion Schemes and Duty payment through EXIM - EOU'S and SEZ ,Special Additional Duty of Customs (SAD) - Imports Tax Credit (ITC) -Custom Clearance -Refund on Exports - Duty free Import.

UNIT- V: EXPORT PRICING AND FINANCING

Pricing objectives - Factors affecting pricing decisions - Steps involved in pricing - Pricing methods - Dumping - Marketing methods- Trade Fairs - Export Incentives - Financing for Export and Import- Pre-shipment & Post - Shipment finance - Letter of Credit - Discounting of Foreign bills -(ECGC) Financial Institutions for International Trade - EXIM Bank- Risk Management.

Text books:

Unit-I: Export Import Procedures, Dr. Natarajan. L, Margham Publications, Chennai. Unit-II: Export Import Management, Parul Gupta, Mc Graw Hill Education (India) Pvt. Limited, 2018, Chennai.

- Unit-III: Logistic and Supply Chain Management. Dr. Natarajan . L, Margham Publications, Chennai.
- Unit-IV: International Trade, Dr. Sankaran .S, Margham Publications, Chennai.
- Unit-V: Export Import Procedures, Dr. Natarajan . L, Margham Publications, Chennai

Reference Books:

- 1.Export Import Management, Justin Paul & Rajiv Aserkar, Oxford University Press, 2013, Noida
- 2. Practical Guide on How to Start Export-Import Business, Chaudhari Shiva CA, Educreation Publishing, Delhi.
- 3. Kenneth D, Building an Import / Export Business, John Wiley&Sons. Inc. 2007, New Jersey
- 4. Belay Seyoum, Export-Import Theory, Practices and Procedures, Routledge Publishers, 2009, New York.
- 5. Kulwinder Singh, Foreign Trade of India, New Century Publications, 2014, New Delhi.

Journals:

- 1. Import, Export and Economic Growth. www. researchgate.net
- 2. International Journal of Export Import Marketing. www. econpapers.repec.org
- 3. The relationship between Import and Export. www. onlinejournal.in
- 4. International Journal of Export Marketing. www.inderscience.com
- 5. Export summary Journal Entries. www. Knowledgecentre. Zuora.com

E-Material:

- 1. How to Start an Import/Export Business. www.entrepreneur.com
- 2. EXIM Financing and Documentation, www. Pondiuni.eu.in
- 3. Importing & Exporting, www.patsula.com
- 4. India's export Import Procedure and documentation, www. research publish.com
- 5. Importing & Exporting in India Leading Edge Alliance. www. leaglbal.com

- 1. After studied Unit-1, the student will be able to understand the International Trade and Foreign Trade Policy
- 2. After studied Unit-2, the student will be able to know the Balance of Payments and FEMA
- 3. After studied Unit-3, the student will be able to understand the Export Procedure and Export Documents.
- 4. After studied Unit-4, the student will be aware of the Guidelines of Import Procedure.
- **5.** After studied Unit-5, the student will be able to know Export Pricing, Financing and EXIM Bank.

CORE ELECTIVE PAPER 2 B. GLOBAL MARKETING

Course Objectives

- 1. To enhance the understanding of the Global Marketing environment
- 2. To extend the knowledge of global market entry strategies
- 3. To facilitate the students global product policy and price
- 4. To bring knowledge about the global marketing channels
- 5. To understand the International marketing promotional strategies.

UNIT-I Global Marketing – Introduction

Global Marketing - Scope - Importance - Global vs. National Marketing - Global Marketing Environment - Social - Cultural - Political - Legal and Regulatory Environments. - International Marketing Research Process, market surveys, marketing information system

UNIT-II Global Market Entry Strategies

Identifying foreign markets - Global Market Entry Strategies - Joint Ventures, Strategic Alliances, Direct Investment, Manufacturing and Franchising. E-marketing.

UNIT-III Global Product Policy and Pricing

Global Customers - Segmentation-Targeting – Global Product Life Cycle – Innovative Products and Adaptation - Global Product Positioning. Branding - Country of Origin Effect and Global Brands. Pricing for International Markets - Objectives - Transfer Pricing Strategy -.Dumping - Incoterms 2020.

UNIT-IV Global Marketing Channels

Global Marketing Channels and Physical Distribution - Channel Objectives and Constraints. Channel Structures – Home County Middlemen - Foreign County Middlemen. Factors Involved in Distribution Systems, Modes of Transportation, International Packaging - Objectives of Logistics and Supply Chain Management.

UNIT-V International Marketing Promotional Strategies

Promotional Strategies - International Marketing Communications – Generic Promotions in International Marketing. Nature of International Advertising - Diversified Advertising Strategy -Personal Selling, Trade Fairs and Exhibitions – Role of Export Promotion Organisations.

Text Books:

- 4. Varshney, R.L. and Bhattacharya B: International Marketing Management, Sultan Chand & Sons, New Delhi.
- 5. Duby V.K.: Export Marketing, Common Wealth Publishers, New Delhi.
- 6. Philip R Cateora, Mary C. Gilly, John L Graham International Marketing, The McGraw-Hill Companies, Inc

Reference Books:

- 1. Warnen J.Keegan: Global Marketing Management, Prentice Hall of India, New, Delhi.
- 2. Cherian and Jacob: Export Marketing, Himalaya Publishing House, Mumbai

- 1. After studied Unit-1, the students will be able to understand the concepts of Global marketing and Marketing information system.
- 2. After studied Unit-2, the students will be able to get full information about global market entry strategies and direct investment.
- 3. After studied Unit-3, the students will be able to understand the global product policy and pricing for international market
- 4. After studied Unit-4, the students will be able to learn important Global Marketing Channels and Physical Distribution
- 5. After studied Unit-5, the students will be able to know about international marketing, promotional strategies and International Marketing communication.

CORE ELECTIVE PAPER 2 C. E-COMMERCE

Course Objective:

1. To gain an understanding of basic concepts, theories and business models underlying E commerce.

2. To improve familiarity with current challenges and issues in E -commerce.

3. To know the concept of Electronic Data Interchange.

4. To enable the students to understand the data and message security.

5. To know about the Electronic Payment Schemes and Digital Payment.

UNIT-I: ELECTRONIC COMMERCE

Meaning- Traditional Commerce – E. Commerce and its application in business. Basic Blocks of E Commerce, E Commerce consumer- Anatomy of E. commerce.

UNIT-II: NETWORK INFRASTRUCTURE

Global Information Distribution Networks – Components of the 1 - way - policy issues- Internet terminology- Internet Governance- An overview of Internet Applications.

UNIT-III: NETWORK LAYERS

Internet Protocol (IP) – Transmission Control Protocol (TCP) – Multimedia Concepts – Advantages of Internet. Electronic Data Interchange (EDI)- EDI and E. Commerce – EDI application in Business.

UNIT-IV: NETWORK SECURITY

Client Server Network security – Firewalls and Network Security- data and message Security – encrypted documents and Electronic Mail. Video conferencing.

UNIT-V: DIGITAL DOCUMENTS

Documents Library- Types of Digital Documents – corporate data warehouse – Electronic Payment Scheme – Intra-organizational Electronic Commerce.

TEXT BOOKS:

1. David Kosiur, understanding Electronic Commerce, Addison Wesley, 1996.

2.Soka, From EDI to Electronic Commerce, Tata McGraw-Hill, 1995.

REFERNCE BOOKS

1. Saily Chan, Electronic Commerce Management, John Wiley, 1998.

2.Neil Randall, The Internet in a Wee, 2ndEdn. Prentice Hall of India, New Delhi.

3.Kamalesh, k. Balaji and Debjani Nag, "E-Commerce", the cutting edge of business, Tata McGraw – Hill, 2000.

4.Marilyn Greenstein and Todd M. Fein Mann, Electronic Commerce, security, Risk Management, Irwin **McGraw Hill, 2000**

- 1. The students will be able to understand the Applications of E commerce in business
- 2. The students will be able to understand the Network Infrastructure of E Commerce.
- 3. The students will be able to understand the Internet Protocols in E Commerce.
- 4. The students will be able to understand the Network Security in E Commerce.
- 5. The students will be able to understand the Types of Digital Documents in E Commerce.

OPEN ELECTIVE

PAPER 2

A. PRINCIPLES OF MANAGEMENT

Course Objectives

1. To enhance the understanding of the Principles of Management

2. To extend the knowledge of steps involved in the process of Planning and decision making.

3. To impart knowledge in Principles of Organisation

4. To provide the students the knowledge about the Authority to delegation

5. To extend the knowledge on Need of co-ordination and Control Process.

Unit – I

Management: Definition- Importance- Principles of Management- Functions of a Manager-Role of a Manager- Skills of a Manager.

Unit – II

Planning: Meaning- Nature- Objectives- Steps in Planning- Limitation of Planning- Decision making- Process of decision making- Types of decisions.

Unit – III

Organisation: Meaning- Nature- Importance- Informal organisation- Principles of Organisation.

Unit – IV

Authority: Meaning- Responsibility – Difference between Authority & Responsibility-Accountability.

Delegation: Meaning- Advantages- Reasons for non-delegation- How to make Delegation effective.

Unit – V

Co-ordination: Need of co-ordination- Types – Techniques- Controlling – Meaning and importance of Controlling- Control Process

Text Books:

1. P.C. Tripathi & P.N. Reddy – Principles of Management – Tata McGraw-Hill.

2. Gupta C.B. Business Management.

Reference Books:

- 1. Hanagan Management Concepts & Practices- MacMillan India Ltd.
- 2. Dr. N. Perma Business Management.
- 3. Massie Essentials of Management Prentice Hall of India.
- 4. J. Jayasankar Principles of Management Margham Pub.
- 5. R.N. Gupta Principles of Management S. Chand Pub.

- 1. After Studied Unit-1, Students will be able to understand the principles & Functions of Management
- 2. After Studied Unit-2, Students will be able to understand the Planning and its importance
- 3. After studied unit-3, Students will be able to understand the Organization and its importance
- 4. After Studied Unit-4, Students will be able to understand the Authority, Responsibility & Delegation.
- 5. After Studied Unit-5, the student will be able to understand the Need for Co-ordination and importance of Control

OPEN ELECTIVE

PAPER 2

B. ELEMENTS OF ACCOUNTING

Course Objectives

- 1. To understand the basic concepts of Accounting.
- 2. To explain students about the Preparation of Ledger Accounts
- 3. To facilitate the students in the Preparation of Trial Balance
- 4. To express to students to about various classification of Error
- 5. To let to know students to know the Balance Sheet with simple Adjustments

Unit - I:

Accounting – Meaning - Definition – Objectives — Double Entry System- Meaning of Debit and Credit - Advantages – Limitations – Types of Accounts– Accounting Rules – Accounting Terminology – Accounting Concepts and Conventions.

Unit - II:

Journal – Meaning – Preparation of Journal – Ledger Accounts – Meaning – Preparation of Ledger Accounts – Advantages over Journal – Ledger Accounts.

Unit - III:

Trial Balance – meaning – Advantages - Preparation of Trial Balance - Subsidiary Books – Meaning – Types.

Unit - IV:

Errors – Classification – Rectification (Rectification after the preparation of final account is excluded) – Suspense Account – Meaning and Need.

Unit - V:

Preparation of Final Accounts – Trading account - Profit and Loss account - Balance Sheet with simple Adjustments

(Weightage: Theory: 30%, Problems: 70%)

Text Books

- 1. Jain, S.P & Narang, N.L., Advanced Accounting, Kalyani Publications.
- 2. Jaya Charulatha and Baskar, Introduction to Accountancy, Vijay Nicholes Imprint Pvt. Ltd., Chennai.

Reference Books

- 1. Gupta, R.L&Radhaswamy, M, Advanced Accounts, Sulthan Chand, New Delhi.
- 2. Shukla&Grewal&Gupta,AdvancedAccounting,S.Chand&Co.,NewDelhi

- 1. After studied Unit-1, the student will able to understand the basis account concepts and double entry system
- 2. After studied Unit-2, the student will able to Pass Journal Entries, Prepare Ledger Accounts.
- 3. After studied Unit-3, the student will able to know the Preparation Trial Balance.
- 4. After studied Unit-4, the student will able to know the Rectification after the preparation of final account is excluded
- 5. After studied Unit-5, the student will able to know the Preparation Trading a/c, Profit & Loss a/c and Balance Sheet

OPEN ELECTIVE

PAPER 2

C. ELEMENTS OF BUSINESS LAW

Course Objectives

- 1. To enhance the understanding of the contract and agreement
- 2. To extend the knowledge of devaluation joint Rights and liabilities and Discharge of contract.
- 3. To facilitate the students to have the understanding about Indemnity and Guarantee
- 4. To know about Bailment and pledge
- 5. To let students to know about Contract of Agency and Termination agency.

<u>Unit – I:</u>

Contract – Formation and Essential element of contract – Types of contract and Agreement – Rules as to Offer – Acceptance and Consideration – Capacity to contract.

<u>Unit – II:</u>

Performance of contract – Devolution of Joint Rights and liabilities – Discharge of contract.

<u>Unit – III:</u>

Indemnity and Guarantee – Features and Distinctions – Extent of Surety's liability – Rights and Discharge of surety.

<u>Unit – IV:</u>

Bailment: Definition – Features – Rights and duties of Bailor and Bailee, pledge: Definition – Features – Rights and duties of pawnor and pawnee – Difference between Bailment and Pledge.

Unit – V:

Contract of Agency – Definition and meaning – creation – Ratification and Requisites - Rights of Principal and Agent – personal liability of Agent – Termination Agency.

Text Book:

- 1. P.C. Tulsian, Business Laws, Tata McGraw Hill, New Delhi.
- 2. Dr. N. Premavathy, Business Law, Sri Vishnu Publications, Chennai

Reference Items: books.

- 1. N.D. Kapoor, Business Laws, Sultan Chand & Sons, New Delhi.
- 2. R.S.N. Pillai & Bagavathi, Business Laws, S. Chand & Co., New Delhi

Course Outcomes:

- 1. After studied Unit-1, the student will be able to acquire the basic knowledge and understand the types of contract and Agreement
- 2. After studied Unit-2, the student will be able to know the essential elements of contract and rules as to offer.
- 3. After studied Unit-3, the student will be able to have the understanding of law relating to indemnity and guarantee
- 4. After studied Unit-4, the student will be able to know the duties and rights of the Bailor and Bailee and Agent and Principal.
- 5. After studied Unit-5, the student will be able to know about law of Agency.

ANNAMALAI UNIVERSITY Syllabi for the Affiliated Colleges

BACHELOR OF BUSINESS ADMINISTRATION

CBCS PATTERN

(2021 - 2022)

The Course of Study and the Scheme of Examinations

S.NO.	Part	Study Components		Ins. hrs /week	Credit	Title of the Paper	Maximum Marks		
		Course Title					CIA	Uni. Exam	Total
SEMESTER I									
1	I	Language	Paper-1	6	4	Tamil/Other Languages	25	75	100
2	II	English (CE)	Paper-1	6	4	Communicative English I	25	75	100
3		Core Theory	Paper-1	5	3	Principles of Management	25	75	100
4	III	Core Theory	Paper-2	5	3	Business Mathematics & Statistics I	25	75	100
5	111	ALLIED -1	Paper-1	6	3	(to choose any 1 out of 3)1. Business Organization2. Principles of Insurance3. Business Ethics	25	75	100
6	III	PE	Paper-1	6	3	Professional English I	25	75	100
7	IV	Environmental Studies		2	2	Environmental Studies	25	75	100
				36	22		175	525	700
SEMESTER II							CIA	Uni. Exam	Total
8	I	Language	Paper-2	6	4	Tamil/Other Languages	25	75	100
9	II	English (CE)	Paper-2	4	4	Communicative English I	25	75	100
10	III	Core Theory	Paper-3	5	3	Business Environment	25	75	100
11	III	Core Theory	Paper-4	5	3	Business Mathematics & Statistics II	25	75	100
12	111	ALLIED-1	Paper-2	6	5	 (to choose any 1 out of 3) A. Customer Relationship Management B. Principles of Banking System C. Fundamentals of Computer 	25	75	100
13		PE	Paper-2	6	3	Professional English II	25	75	100
14	IV	Value Education		2	2	Value Education	25	75	100
15	IV	Soft Skill		2	1	Soft Skill	25	75	100
				36	25		200	600	800
ANNAMALAI UNIVERSITY

BACHELOR OF BUSINESS ADMINISTRATION

SYLLABUS UNDER CBCS (2021-2022)

SEMESTER I

CORE THEORY PAPER - 1

PRINCIPLES OF MANAGEMENT

Course Objectives

- 1. To familiarize the students with basic concept of management.
- 2. To acquire skills to become a good manager.
- 3. To plan effectively.
- 4. To take right decisions.
- 5. To understand the theories of management.
- 6. To understand the functions of management.

UNIT-1

Management - Definition - Importance - Nature and Scope of Management - Objectives of management - Process - Levels of Management - Role and function of a Manager – Administration vs Management - Management as an Art or Science - Management as a Profession - Contributions of Henry Fayol and F W Taylor to Management.

UNIT-2

Planning – Definition- Nature - Importance - Steps in Planning – Limitations of Planningfeatures of good plan- obstacles to effective planning- types- Objectives - Policies -Procedures - and Methods - Decision making – definition - Process of decision making -Types of managerial decision- key to success in decision making.

UNIT-3

Organizing – Meaning of organisation- elements of organisation – Process of organizing-Importance - Types of Organization structure - Span of Control –meaning- theory of Graicunass- factors determine span of management- Principles of Organisation-Departmentation Committee - formal organisation- Informal Organization.

UNIT-4

Authority - Delegation - Decentralization - Difference between authority and power - Uses of authority - Staffing - Sources of recruitment - Selection process - Training - Directing -Nature and purpose of Directing - Motivation (Maslow's Need Hierarchy Theory, Hertzberg Theory, X and Y Theory) – Social responsibilities of business.

UNIT-5

Co-ordination – nature and characteristics - Need of co-ordination - Types - Techniques -Distinction between Co-ordination and Co-operation - Controlling - meaning- nature and purpose of control- need and importance of Controls - Control Process- problems in control process.

Text Books

Unit-1

P.C. Tripathi & P.N. Reddy, Principles of Management, Tata McGraw-Hill Dr. C.D.Balaji, Principles of Management, Margham Publications.

Unit-2

J. Jayasankar , Principles of Management , Margham Publications. Dr. C.B.Gupta Business Management, Sultan Chand & Sons

Unit-3 P.C. Tripathi & P.N. Reddy , Principles of Management , Tata McGraw-Hill Dr. C.B.Gupta Business Management, Sultan Chand & Sons

Unit-4

J. Jayasankar, Principles of Management, Margham Publications. Dr. C.B.Gupta Business Management, Sultan Chand & Sons

Unit-5

J. Jayasankar, Principles of Management, Margham Publications. Dr. C.B.Gupta Business Management, Sultan Chand & Sons

Reference Items: Books and Journal

- 1. Hanagan, Management Concepts & Practices, MacMillan India Ltd.
- 2. Prasad L.M., Principles and Practice of Management, Sultan Chand & Sons, New Delhi.
- 3. Peter F. Drucker, Practice of Management,
- 4. Harold Koontz, Aryasri & Heniz Weirich, Principles of Management Tata McGraw-Hill
- 5. R.N. Gupta, Principles of Management, S.Chand &Co.
- 6. R.K.Sharma and Shashi K Gupta, Principles of Management, Kalyani Publishers.
- 7. James A.F.Stoner, Edward and Daniel, Management, Pearson Education.

E- Materials

- <u>www.sasurieengg.com</u>
- <u>www.toolshero.com</u>
- <u>www.mindtools.com</u>
- <u>https://education.stateuniversity.com</u>
- <u>https://iedunote.com</u>
- <u>https://managementhelp.org</u>
- <u>https://icmrindia.org</u>
- <u>https://casestudyinc.com</u>

Course outcome

- 1. After studied unit-1, the student will be able to understand the concept of management.
- 2. After studied unit-2, the student will be able to plan and make decisions.

3. After studied unit-3, the student will be able to differentiate organisation structure and know the functioning

4. After studied unit-4, the student will be able to delegate work, differentiate between power and authority

5. After studied unit-5, the student will be able to coordinate activities in an organisation.

CORE THEORY PAPER - 2

BUSINESS MATHEMATICS AND STATISTICS – II

Course Objectives

1. To familiarize students with the basic concepts in Business Mathematics and Statistics

- 2. To make students understands various Measure of central tendency.
- 3. To Know principles of construction of Dispersion
- 4. To be able to choose rational options in practical decision making Finance
- 5. To have Rules for Differentiation

UNIT- I

Statistics – Definition – scope and Limitation – Presentation of data- Simple Bar Diagram, Multiple Bar Diagram ,Component Bar Diagram ,Percentage Bar Diagram ,Pictogram Diagrammatic and graphical Representation of Data- Frequency Polygon, Frequency Curve, Cumulative Frequency Curve.

UNIT-II

Measure of central tendency – Arithmetic Mean ,Weighted Arithmetic Mean –Frequency Distribution ,Properties of AM Combination Mean ,Geometric Mean ,Harmonic Mean - Median and Mode ,Quartile and Deciles .

UNIT-III

Measure of Dispersion – Range, Merit and Demerit - Mean Deviation – Quartile Deviation - Standard Deviation – Relative Measure- Coefficient Variation.

UNIT-IV

Mathematics for Finance – Simple and compound Interest, Effective rate of interest – Annuities, Leasehold estate, Free Hold Estate, Amortization, Immediate Annuity, Present value of an immediate annuity - Discounts and mathematics present values.

UNIT- V

Basic calculus – Rules for Differentiation, Introduction, Function, Properties of limits – Continuity -Derivative of trigonometric function, Product Rule, Quotient Rule, Function.

Proportion of Theory and Problem: 20:80

Text Books

Unit-1

Dr. P.R. Vittal Business Mathematics and Statistics - Margham Publications.

S P Rajagopalan and R Sattanathan - Business Mathematics- Vijay Nicole Imprients (p) Ltd Unit-2

Dr. P.R. Vittal Business Mathematics and Statistics – Margham Publications. S P Rajagopalan and R Sattanathan - Business Statistics - Vijay Nicole Imprients (p) Ltd **Unit-3**

Dr. P.R. Vittal Business Mathematics and Statistics – Margham Publications. Prof. A. V. Rayarikar , P. G. Dixit Business Mathematics And Statistics Kindle Edition

Unit-4

Dr. P.R. Vittal Business Mathematics and Statistics – Margham Publications. Prof. A. V. Rayarikar , P. G. Dixit Business Mathematics And Statistics Kindle Edition **Unit-5**

Dr. P.R. Vittal Business Mathematics and Statistics – Margham Publications. S P Rajagopalan and R Sattanathan - Business Statistics - Vijay Nicole Imprients (p) Ltd **Reference Items: Books and Journal**

- 1. J.K. Sharma Business Statistic , Pearson Publication
- 2. P. Navaneetham. Business Statistic and Mathematics
- 3. S.P Gupta, Statistical Methods, Sultan Chand & Sons
- 4. S.G Gupta, and V K Kapoor, Fundametal of Applied Statistics, Sultan Chand & Sons
- 5. A Francis; Ben Mousley Business mathematics and statistics Andover, United Kingdom Cengage Learning

E- Materials

- <u>https://www.worldcat.org/title/business-mathematics-and-statistics/oclc/942846251</u>
- <u>https://bookboon.com/en/statistics-and-mathematics-ebooks</u>
- <u>https://books.google.co.in/books/about/Business_Mathematics_and_Statistics.html?id</u> <u>=wuX_rGhbp60C</u>

Course Outcome

After studied this course the students will be able -

- 1. To apply basic terms of statistical data solving practical problems field of as of business.
- 2. To explain basic methods of Measure of central tendency
- 3. To solve problems in the areas of simple and compound interest account, use of compound interest.
- 4. To discuss effects of various types and methods of interest account.
- 5. Connect acquired knowledge and skills with practical problems.

ALLIED – 1 (To choose any 1 out of the given 3) PAPER –1 1. BUSINESS ORGANIZATION

Course Objectives

- 1. The course aims to provide the basic concept with regard to business enterprises
- 2. To obtain knowledge of business and its functional areas.
- 3. To understand in detail the types of Business.
- 4. To study the factors that influence the location
- 5. To obtain in depth understanding of the Stock Exchanges and its functions.
- 6. To gain Knowledge about Trade Associations and Chamber of commerce

UNIT-I

Business - Meaning - Types of Business and Profession - Organization - Meaning and Importance of Business Organization.

UNIT-II

Forms of Business Organization - Sole Trader, Partnership - Joint Hindu Family System - Joint Stock Companies - Co-operative Societies - Public Utilities and Public Enterprises.

UNIT-III

Location of Industry - Factors influencing location and size - Industrial Estates and District Industries Centre.

UNIT-IV

Stock Exchange - Functions - Working - Services - Regulations of Stock Exchange in India, Business combinations - Causes - Types - Effects.

UNIT-V

Trade Associations and Chamber of Commerce – Objectives - Functions – Differences between Trade Association and Chamber of Commerce.

Text Books

Unit 1

Sundar K, Business Organization, Vijay Nicole Imprints Pvt. Ltd. G. Prasad, C.D. Balaji, Business Organization, Margham Publications.

Unit 2

Tapas Ranjan Saha, Business Organisation and Management, Vijay Nicole Imprints Gupta C B – Modern Business Organisation, National Publishing House,

Unit 3

Gupta C B –Modern Business Organisation, National Publishing House, Vasudevan and Radhaswami, Business Organization, S. Chand & Company, New Delhi.

Unit 4

Gupta C B –Modern Business Organisation, National Publishing House, Sundar K, Business Organization, Vijay Nicole Imprints Pvt. Ltd.

Unit 5

Gupta C B – Modern Business Organisation, National Publishing House, Vasudevan and Radhaswami, Business Organization, S. Chand & Company, New Delhi

Reference Items: Books and Journal

- 1. Bhusan Y. K, Business Organization.
- 2. Prakesh Jagadeesh , Business Organization and Management.
- 3. Reddy P. N. and Gulshan S , Principles of Business Organization and Management.
- 4. Chabra T N, Business Organisation.
- 5. M C. Shukla, Business Organization & Management

E- Materials

- business.udemy.com
- www.coursera.org > browse > business
- <u>www.businessmanagementdaily.com > business-management-daily-ed.</u>

Course Outcome

- **1.** After studied unit -1, the students understands the basic fundamentals of the business organization.
- **2.** After studied unit -2, the student aattains the knowledge of various forms and types of the business organization.
- **3.** After studied unit -3, the student understands the main working aspects of organizations.
- **4.** After studied unit -4 the student aacquires in depth understanding of the Stock Exchanges and its functions.
- **5.** After studied unit -4, the students gain knowledge about Trade Associations and Chamber of commerce

ALLIED – 1 PAPER –1

2. PRINCIPLES OF INSURANCE

Course Objectives:

- 1. To understand the basic functions and legal principles of insurance.
- 2. To attain the knowledge of various types of Insurance.
- 3. To apply the knowledge on the insurance-related legal principles.
- 4. To attain in depth knowledge in Life Assurance.
- 5. To understand Marine and Fire Insurance.

UNIT-I

Definition of insurance - classification of Contracts of Insurance - Marine and Non-Marine - General principles of law as applied to non-marine insurance.

UNIT-II

Life Assurance - objectives of Life Assurance - principles of Life Assurance - different plans of Life Assurance and annuities - policy condition and privilege - assignment and nomination - lapses and revivals - surrender values and loans - claims - double insurance.

UNIT-III

Marine Insurance - principles of marine insurance - functions of marine insurance - proximate clause - subrogation and contribution

UNIT-IV

Types of marine policy - clauses in general use - warranties - kinds of marine losses - reinsurance and double insurance.

UNIT-V

Fire insurance - principles of law as applied to fire insurance - the subject matter of fire insurance - fire waste - hazard types of fire policy - cover notes - surveys and inspection average - re-insurance - renewals.

Text Books

Unit 1

Periasamy P – Fundamentals of Insurance –Vijay Nicole Imprints (P) Ltd. Dr. A. Murthy, Elements of Insurance – Margham Publications

Unit 2

Dr. A. Murthy-Principles and Practice of Insurance, Margham Publications Gupta P K – Insurance and Risk Management – Himalaya Publishing House

Unit 3

Dr. A. Murthy-Principles and Practice of Insurance, Margham Publications Gupta P K – Insurance and Risk Management – Himalaya Publishing House Mishra M N – Principles and Practice of Insurance – S Chand & Co

Unit 4

Dr. A. Murthy-Principles and Practice of Insurance, Margham Publications Gupta P K – Insurance and Risk Management – Himalaya Publishing House Panda G S –Principles and Practice of Insurance –Kalyani Publishers.

Unit 5

Dr. A. Murthy-Principles and Practice of Insurance, Margham Publications Gupta P K – Insurance and Risk Management – Himalaya Publishing House

Reference Items: Books and Journal

- 1. Dr. B. Vardharajan Insurance Vol 1 and 2. Tamil Text Book.
- 2. R.S. Sharma Insurance Principle & Practice Vara Bombay, 2006.
- 3. A Murthy Elements of Insurance Risk management & Insurance Harrington, 2006 Tata McGraw Hill

E- Materials

- <u>www.kaplanfinancial.com > insurance</u>
- www.insurancecareertraining.com
- www.nationalonlineinsuranceschool.com

Course Outcome

- **1.** After studied Unit 1, the student understands the basic functions and legal principles of insurance.
- **2.** After studied Unit 2, the student aattains the knowledge of various types of Insurance.
- **3.** After studied Unit 3, the student will be able to apply their knowledge on the insurance-related legal principles.
- **4.** After studied Unit 4 the student gains in depth knowledge acquisition in Life Assurance.
- **5.** After studied Unit 5 the student aacquires in depth understanding of Marine and Fire Insurance.

ALLIED – 1 PAPER –1 3. BUSINESS ETHICS

Course Objectives:

- 1. To provide basic knowledge of business ethics and values and its relevance in modern context.
- 2. To attain knowledge invarious types of Ethics.
- 3. To learn the ethical practices to be followed in Human Resource and marketing activities.
- 4. To be socially responsible towards the stakeholders of Business.
- 5. To develop the social skills required for the successful practice of management within the framework of societal values.

UNIT-I

Role and importance of Business Ethics and Values in Business - Definition of Business Ethics Impact on Business Policy and Business Strategy - Role of CEO - Impact on the Business Culture.

UNIT-II

Types of Ethical issues - Bribes - Coercion - Deception - Theft - Unfair Discrimination.

UNIT-III

Ethics internal - Hiring - Employees - Promotions - Discipline - Wages - Job Description - Exploitation of employees.

UNIT-IV

Ethics External - Consumers - Fair Prices - False Claim Advertisements. Environment Protection - Natural - Physical - Society - Relationship of Values and Ethics - Indian Ethos -Impact on the performance.

UNIT-V

Social Responsibilities of Business towards Shareholders, Employees, Customers, Dealers, Vendors, Government - Social Audit.

Text Books

Unit 1

Dr.S. Shankaran, Business Ethics & Values, Margham Publications Memoria & Subba Rao, Business Panning and Policy, Himalaya Publishing House, Mumbai.

Unit 2

Dr.S. Shankaran, Business Ethics & Values, Margham Publications Memoria & Subba Rao, Business Panning and Policy, Himalaya Publishing House, Mumbai.

Unit 3

Dr.S. Shankaran, Business Ethics & Values, Margham Publications Memoria & Memoria, Business Policy,

Unit 4

Dr.S. Shankaran, Business Ethics & Values, Margham Publications

Unit 5

Dr.S. Shankaran, Business Ethics & Values, Margham Publications Bodi R and Bodi N. V, Business Ethics,

Reference Items: Books and Journal

- 1. David J. Fritzsche, Business Ethics: A Global & Management Perspective , Tata McGraw-Hill
- 2. Ramaswamy Namakumari Strategic Planning Corporate Strategy , Laxmi Publications Pvt. Ltd.
- 3. Velasquez Business Ethics, Prentice Hall of India
- 4. Peter Madsen & Jay M. Shafritz, Essential of Business Ethics
- 5. Ken Smith and Phil Johnson, Business Ethics and Business Behavior.
- 6. Pratley Essence of Business Ethics, Prentice Hall of India.

E- Materials

- josephsononbusinessethics.com
- www.globethics.net
- <u>www.ethicssage.com</u>

Course Outcomes

- 1. After studied Unit 1, the student understands the importance of Ethics and Values in Business.
- 2. After studied Unit 2, the student aacquires the knowledge of various types of Ethics.
- 3. After studied Unit 3, the student learns the ethical practices to be followed in Human Resource and marketing activities.
- 4. After studied Unit 4, the students learn to be socially responsible towards the stakeholders of Business.
- 5. After studied Unit 5, the students develop the social skills required for the successful practice of management within the framework of societal values.

SEMESTER II

CORE THEORY PAPER - 3

BUSINESS ENVIRONMENT

Course Objectives

- 1. To know factors that affect the business environment Its nature and significance -Brief overview of political - Cultural - Legal - Economic and social environments and their impact on business and strategic decisions.
- 2. To understand how Political Environment Government and Business relationship in India Provisions of Indian constitution pertaining to business have an influence on any organization.
- 3. To understand how influences from the society, cultural heritage, social attitudes, foreign culture, castes and communities, joint family systems, linguistic and religious groups and types of social organizations impact organizations.
- 4. To know how Economic Environment Economic Systems influence organizations. To understand the impact from Macro-Economic Parameters - GDP - Growth Rate -Population - Urbanization - Fiscal deficit - Plan investment and Per capita Income.
- 5. To know how Financial Environment Financial System Commercial banks RBI IDBI Non-Banking Financial Companies NBFC's influence organizations.

UNIT-I

The concept of Business Environment - Its nature and significance - Brief overview of political - Cultural - Legal - Economic and social environments and their impact on business and strategic decisions.

UNIT-II

Political Environment - Government and Business relationship in India - Provisions of Indian constitution pertaining to business

UNIT-III

Social Environment - Cultural heritage - Social attitudes - impact of foreign culture - castes and communities - Joint family systems - Linguistic and Religious groups - Types of Social Organization

UNIT-IV

Economic Environment - Economic Systems and their impact of Business - Macro Economic Parameters like GDP - Growth Rate - Population - Urbanization - Fiscal deficit -Plan investment - Per capita Income and their impact on business decisions

UNIT-V

Financial Environment - Financial System - Commercial banks - RBI - IDBI - Non-Banking Financial Companies NBFC's

Text Books

Unit 1

Dr. S. Sankaran - Business Environment, Margham Publications K. Aswathappa – Essentials of Business Environment, Himalaya Publishing House

Unit 2

Dr. S. Sankaran - Business Environment, Margham Publications Namitha Gopal –Business Environment –Vijay Nicole Imprints K. Aswathappa – Essentials of Business Environment, Himalaya Publishing House

Unit 3

Dr. S. Sankaran - Business Environment, Margham PublicationsJoshi - Business Environment- Kalyani PublishersK. Aswathappa – Essentials of Business Environment, Himalaya Publishing House

Unit 4

Dr. S. Sankaran - Business Environment, Margham Publications Namitha Gopal –Business Environment –Vijay Nicole Imprints

Unit 5

Dr. S. Sankaran - Business Environment, Margham PublicationsJoshi - Business Environment- Kalyani PublishersK. Aswathappa – Essentials of Business Environment, Himalaya Publishing House

Reference Items: Books and Journal

- Francis Cherunilam: Business Environment Text and Cases, Himalaya Publishing House, New Delhi.
- 2. A.C. Fernando, Business Environment, Pearson.
- 3. Ian Worthington and Chris Britton: The Business Environment, Prentice Hall
- 4. Shaikh Saleem, Business Environment, Pearson
- 5. Rudder Dutt and Sundharam, K.P.M.: Indian Economy, S. Chand & Company Limited, New Delhi.

- 6. Misra, S.K. and Puri, V.K.: Economic Environment of Business, Himalaya Publishing House, New Delhi.
- 7. Misra, S.K. and Puri, V.K.: Indian Economy, Himalaya Publishing House, New Delhi.

E- Materials

- <u>https://study.com/academy/lesson/what-is-business-environment-definition-factors-quiz.html</u>
- <u>https://www.investopedia.com/terms/p/pest-analysis.asp</u>
- <u>https://www.mindtools.com/pages/article/newTMC_09.htm</u>
- https://link.springer.com/chapter/10.1007/978-3-319-32754-9_3
- <u>https://en.wikipedia.org/wiki/Gross_domestic_product</u>

Course Outcome

After studying unit-1, the student will be able to learn factors that affect the business environment - Its nature and significance - Brief overview of political - Cultural - Legal -Economic and social environments and their impact on business and strategic decisions.

After studying unit-2, the student will be able to understand how Political Environment -Government and Business relationship in India - Provisions of Indian constitution pertaining to business have an influence on any organization.

After studying unit-3, the student will be able to understand how influences from the society, cultural heritage, social attitudes, foreign culture, castes and communities, joint family systems, linguistic and religious groups and types of social organizations impact organizations.

After studying unit-4, the student will be able to know how Economic Environment -Economic Systems influence organizations. To understand the impact from Macro-Economic Parameters - GDP - Growth Rate - Population - Urbanization - Fiscal deficit - Plan investment and Per capita Income

After studying unit-5, the student will be able to know how Financial Environment -Financial System - Commercial banks - RBI - IDBI - Non-Banking Financial Companies NBFC's influence organizations.

CORE THEORY PAPER - 4 BUSINESS MATHEMATICS AND STATISTICS II

Course Objectives

- 1. To familiarize students with the basic concepts in Business Mathematics and Statistic.
- 2. To make students understands various tools and techniques in Matrix.
- 3. To Know principles of Correlation & Regression.
- 4. To be able to choose rational options in Time Series.
- 5. To have skills in analysis of Index Number & UN weighted Index Numbers.

UNIT-1

Matrix Theory, Equal Matrices ,Diagonal Matrix ,Scalar Matrix, Unit Matrix ,Null Matrix, Row Matrix, Column Matrix, Matrix Operation – Operation on Determinants – Inverse of a Square Matrix (not more than 3^{rd})

UNIT-2

Solving Simultaneous Equation using matrix Method, Simulation Linear Equations, General properties of matrices, Method of Reduction

UNIT-3

Correlation .Karl Pearson's Correlation ,Positive Correlation ,Negative Correlation ,No Correlation ,Simple Correlation – Scatter Diagram – Numerical Value of the Correlation Coefficient - Concurrent Deviation method – Rank Correlation – Properties of Correlation Coefficient ,Limitation -Uses of Correlation in Business regression – Regression Lines – Regression coefficients – Uses of Regression in Business Problems.

UNIT-4

Time Series – Component of time Series, Secular trend, Seasonal Variation, Cyclical Variation, Irregular Variation – Measurement of Trend, Graphic Method – Semi Average method –Moving Average method –Method of Least Squares – Measurement of Seasonal Variations – Simple Average Method – Ratio to Moving Average Method

UNIT-5

Index Number – Weighted and UN weighted Index Numbers – Cost of Living Index Number – Average of Relative Price Indices-Quality Index Number- Test on index Numbers- Time reversal test, Factors reversal test- Circular test.

Proportion of Theory and Problem: 20:80

Text Books

Unit-1

Dr. P.R. Vittal Business Mathematics and Statistic – Margham Publications.

S P Rajagopalan and R Sattanathan - Business Mathematics- Vijay Nicole Imprients (p) Ltd Unit-2

Dr. P.R. Vittal Business Mathematics and Statistic – Margham Publications. S P Rajagopalan and R Sattanathan - Business Statistics - Vijay Nicole Imprients (p) Ltd **Unit-3**

Dr. P.R. Vittal Business Mathematics and Statistic – Margham Publications. Prof. A. V. Rayarikar , P. G. Dixit Business Mathematics And Statistics Kindle Edition **Unit-4**

Dr. P.R. Vittal Business Mathematics and Statistic – Margham Publications. Prof. A. V. Rayarikar , P. G. Dixit Business Mathematics And Statistics Kindle Edition **Unit-5**

Dr. P.R. Vittal Business Mathematics and Statistic – Margham Publications. Agarwal B.M. Business Mathematics & Statistics **Reference Items: Books and Journal**

- 1. Agarwal B.M. Business Mathematics & Statistics Ane Books Pvt Ltd, 2009
- 2. Andre Francis Business Mathematics and Statistics Six Edition
- 3. A Francis; Ben Mousley Business mathematics and statistics Andover, United Kingdom Cengage Learning, 2014
- 4. Prof. A. V. Rayarikar , P. G. Dixit Business Mathematics And Statistics Kindle Edition
- 5. B M Aggarwal Business Statistics Ane Books Pvt Ltd

E- Materials

- https://www.researchgate.net/publication/316507362_Business_Mathematics_Statistics
- <u>https://www.toppr.com/guides/business-mathematics-and-statistics/</u>
- https://www.dphu.org/uploads/attachements/books/books_3502_0.pdf

Course Outcomes

After studied this subject the student will be able to :

- 1. Identify statistical tools needed to solve various business problems.
- 2. Solving Simultaneous Equation using matrix Method.
- 3. Able to find out the Correlation & regression.
- 4. Develop Time Series Component of time Series Secular trend Seasonal Variation Cyclical Variation, Irregular Variation.
- 5. Students can Use Index Number , Weighted and UN weighted Index Numbers in practical application .

ALLIED – 1 (To choose any 1 out of the given 3) PAPER –2

1. CUSTOMER RELATIONSHIP MANAGEMENT

Course Objectives

- 1. To understand the significance of customer satisfaction, and how Customer Relationship Management (CRM) can enhance customer satisfaction, its definition, how customer loyalty benefits companies. In addition, how CRM can help in marketing.
- 2. To enable students, learn various stages of CRM, factors that drive CRM, Benefits of CRM, growth of CRM market in India and vital principles of CRM.
- 3. To understand what CRM Program is, to know the groundwork required for effective use of CRM, to know various components of CRM and types of CRM.
- 4. To understand processes that involve in customer relationship management (CRM) to get customers and maintain a relationship with them. Other processes include the management of customer data, information analysis, and generating reports to gain insights. Other aspects of the business operation that involves customers such as sales, business development, sales, marketing, and customer service will also be understood.

You will also learn how to facilitate CRM processes and procedures while integrating with other business workflows.

5. To know the use of use of technology in CRM – Call Center Process – CRM Technology Tools – Implementation – Requirements Analysis – Selection of CRM Package – Reasons and Failure of CRM.

UNIT-I

CRM – Introduction – Definition – characteristics- objectives- Need for CRM – Complementary Layers of CRM – Customer Satisfaction – factors influencing customer satisfaction- determinants- benefits- customer value- building customer satisfaction -Customer Loyalty –features- importance- loyal customer ladder- Product Marketing – importance – marketing mix- Direct Marketing- meaning- nature difference between direct and conventional marketing- functions- advantages and limitations.

UNIT-II

Customer Learning Relationship – meaning- areas of learning relationship- categories of relationship- basis for building learning relationships – Promise- trust- commitment-satisfaction- strategies and guidelines or building learning relationships- Key Stages of CRM – Forces Driving CRM –key principles of CRM- Benefits of CRM – limitations of CRM-Growth of CRM Market in India – CRM in different sectors in India.

UNIT-III

CRM Program and strategy– Components of CRM -Groundwork for Effective use of CRM – types of CRM program- planning CRM program - role of CRM program- managing

CRM program- measuring effectiveness of CRM program- Information Requirement for an Effective use of CRM .

UNIT-IV

CRM Process Framework – Formation process- Governance Process – Performance Evaluation Process- evolution process- customers in CRM- Relationship marketing and CRM process – tool- difference between relationship marketing and CRM- objectives of relationship marketing- customer relationship hierarchy- six market framework of relationship marketing- dimensions- strategies- essentials of Relationship Marketing.

UNIT-V

Use of Technology in CRM – 11 C's of relationship criteria for creating value for customers- use of technology- CRM Technology Tools – E-CRM – Requirement Analysis for CRM technology- Implementation of CRM technology– emerging trends in CRM technology- pitfalls of IT focus in CRM-Call centre- classification- call centre process- use of technology in call centre- operational challenges- CRM Package/ software – functional areas- Key CRM software packages- selection of CRM packages- benefits of software- CRM implementation- phases- business transformation process- issues in CRM implementation- Reasons for Failure of CRM- guidelines for successful CRM implementation.

Text books

Unit 1

Dr. Freda Gnanaselvam & A.V. Aruna Kumar, Customer Relationship Management, Takur Publications

G.Shainesh, Jagdish N Sheth – Customer Relationship Management – Laxmi Publication Pvt. Ltd.

K.Balasubramaniyan - Customer Relationship Management, , GIGO publication, 2005.

Unit 2

Dr. Freda Gnanaselvam & A.V. Aruna Kumar, Customer Relationship Management, Takur Publications

G.Shainesh, Jagdish N Sheth – Customer Relationship Management – Laxmi Publication Pvt. Ltd.

Dr. P. Sheela Rani - Customer Relationship Management - Margham Publications.

Unit 3

Dr. Freda Gnanaselvam & A.V. Aruna Kumar, Customer Relationship Management, Takur Publications

K.Balasubramaniyan - Customer Relationship Management, , GIGO publication, 2005.

Unit 4

Dr. Freda Gnanaselvam & A.V. Aruna Kumar, Customer Relationship Management, Takur Publications

G.Shainesh, Jagdish N Sheth – Customer Relationship Management – Laxmi Publication Pvt. Ltd.

Dr. P. Sheela Rani – Customer Relationship Management – Margham Publications.

Unit 5

Dr. Freda Gnanaselvam & A.V. Aruna Kumar, Customer Relationship Management, Takur Publications K.Balasubramaniyan - Customer Relationship Management, , GIGO publication, 2005.

Reference Items: Books and Journal

- 1. Dr.Ravi Kalakota E-business Roadmap for success, , Pearson education Asia, 2000.
- 2. Rebecca Saunders Business The Dell way, India book distributors, 2000.
- 3. Amrit tiwana The essentials guide to knowledge management E-business and CRM application, , Pearson education, 2001.

1. HANDBOOK OF CRM: Achieving Excellence in Customer Management by Adrian Payne, Butterworth-Heinemann is an imprint of Elsevier, Linacre House, Jordan Hill, Oxford OX2 8DP, ISBN-13: 978-07506-6437-0 ISBN-10: 07506-6437-1

2. Customer Relationship Management by Kristin Anderson and Carol Kerr, McGraw-Hill, DOI: 10.1036/0071394125

3. CRM at the Speed of Light, Fourth Edition: Social CRM 2.0 Strategies, Tools, and Techniques for Engaging Your Customers Hardcover – December 9, 2009 by Paul Greenberg, Publisher: McGraw-Hill Education; 4 edition, ISBN-10: 0071590455, ISBN-13: 978-0071590457

4. The Definitive Guide to Social CRM: Maximizing Customer Relationships with Social Media to Gain Market Insights, Customers, and Profits (FT Press Operations Management) 1st Edition by Barton J. Goldenberg, Publisher: Pearson FT Press; 1 edition (March 20, 2015), Language: English, ISBN-10: 0134133900, ISBN-13: 978-0134133904

5. Salesforce.com For Dummies (For Dummies (Computer/Tech)) 6th Edition by Liz Kao and Jon Paz, Publisher: For Dummies; 6 edition (April 25, 2016), Language: English, ISBN-10: 9788126563012, ISBN-13: 978-1119239314

6. Customer Experience 3.0: High-Profit Strategies in the Age of Techno Service Hardcover – August 12, 2014 by John Goodman, Publisher: AMACOM; First edition (August 12, 2014), Language: English, ISBN-10: 081443388X, ISBN-13: 978-0814433881

7. ROI from CRM: It's about sales process, not just technology Paperback – May 4, 2016, by Brian K. Gardner, Publisher: Gale Media, Inc. (May 4, 2016), Language: English, ISBN-10: 0990673847, ISBN-13: 978-0990673842

E- Materials

- <u>https://www.forbes.com/sites/forbesagencycouncil/2017/10/24/why-is-customer-relationship-management-so-important/#5418b6cb7dac</u>
- <u>https://managementstudyguide.com/importance-of-crm.htm</u>
- <u>https://www.slideshare.net/jaiserabbas/customer-relationship-management-crm-10974369</u>
- https://www.salesforce.com/crm/what-is-crm/

- <u>https://searchcustomerexperience.techtarget.com/definition/CRM-customer-relationship-management</u>
- <u>https://www.investopedia.com/terms/c/customer_relation_management.asp</u>
- https://financesonline.com/what-is-crm-process/
- <u>https://www.itarian.com/customer-relationship-management.php</u>
- <u>https://www.intelestream.net/en/25-reasons-crm-fails-and-how-to-fix-them/</u>
- <u>https://www.gartner.com/en/newsroom/press-releases/2019-06-17-gartner-says-worldwide-customer-experience-and-relati</u>
- <u>https://marketersmedia.com/crm-software-market-2019-global-size-growth-status-latest-application-share-recent-trends-and-better-investment-opportunities-by-forecast-to-2023/465591</u>

Course Outcome

1. After studied unit-1, the student will be able to know CRM's broad category of concepts, tools, and processes that allows an organization to understand and serve everyone with whom it comes into contact. CRM is about gathering information that is used to serve customers – basic information, such as name, address, meeting and purchase history, and service and support contacts. In a supplier relationship it might be procurement history, terms and conditions, or contact information. This information is then used to better serve the clients.

This chapter will also let you know how CRM helps businesses build a relationship with their customers that, in turn, creates loyalty and customer retention. Since customer loyalty and revenue are both qualities that affect a company's revenue, CRM is a management strategy that results in increased profits for a business.

- **2.** After studied unit-2, student will be able to learn various stages of CRM, driving forces beyond CRM, Benefits of implementing CRM, growth of CRM market in India and important principles of CRM.
- **3.** After studied unit-3, student will be able to know what CRM Program is; the groundwork required for effective use of CRM; various components of CRM and types of CRM
- 4. After studied unit-4, you will be able to learn various processes that involve in customer relationship management (CRM) to get customers and maintain a relationship with them; other processes include the management of customer data, information analysis, and generating reports to gain insights. Other aspects of the business operation that involves customers such as sales, business development, sales, marketing, and customer service will also be understood. You will also learn procedures that facilitate and help in the integration of CRM with other business workflows.
- **5.** After studied unit-5, student will be able to know the use of technology in CRM call center process; implementation of CRM; Requirements Analysis of CRM; selection of CRM package and reasons for the failure of CRM.

ALLIED – 1 PAPER –2 2. PRINCIPLES OF BANKING SYSTEM

Course Objectives

- 1. To know how banking system functions within the financial system: Banks and their development.
- 2. To know the concept of Social Responsibility of Banks Role of banks in the economy, and various types of banking.
- 3. To understand the role of Reserve Bank of India (central bank) Commercial Banks -Cooperative Banks - flow of cooperative funds - Urban Cooperative Bank - Land Development Banks - Development Bank - NABARD (National Bank for Agriculture and Rural Development) - Regional Rural Bank - EXIM bank
- 4. To know the functions of modern Commercial Banks Savings and Current accounts, various deposits, loans, Overdraft and Cash Credit.
- 5. To know a few financial services including Factoring Lease Finance Export Finance - Credit Card - Credit Rating - E-business - E-commerce - E-banking -Automatic Teller Machines.

UNIT-I

Introduction - Origin of Banks - Definition of Bank - Types of Bank - Banking Systems - Unit Bank - Merits of Unit Bank - Demerits of Unit Banks - Branch Bank - Its merits and demerits - Financial System - Components of financial system.

UNIT-II

Concept of Social Responsibility of Banks - Role of banks in Primary, Secondary and Territory sector - Mixed Banking - Retail Banking - Wholesale Banking - Universal Banking.

UNIT-III

Reserve bank of India (central bank) - Commercial Banks - Cooperative Banks - flow of cooperative funds - Urban Cooperative Bank - Land Development Banks - Development Bank - NABARD (National Bank for Agriculture and Rural Development) - Regional Rural Bank - EXIM bank

UNIT-IV

Functions of Modern Commercial Banks - Savings account - Current account - Difference between savings account and current account - Fixed Deposit - Recurring Deposit - Granting of Loan - Clean Loan - Second loan - Overdraft -Cash Credit.

UNIT-V

Factoring - Lease Finance - Export Finance - Credit Card - Credit Rating - E-business - Ecommerce - E-banking - Automatic Teller Machines.

Text Books

Unit 1

Santhanam -Banking and Financial System ,Margham Publications S.N.Maheshwari -Banking Law Theory and Practice , Kalyani Publishers

Unit2

Santhanam -Banking and Financial System ,Margham Publications Sundharam & Varshney- Banking Theory Law and Practice – Sultan Chand & Sons S.N.Maheshwari -Banking Law Theory and Practice , Kalyani Publishers

Unit 3

Santhanam -Banking and Financial System ,Margham Publications Sundharam & Varshney- Banking Theory Law and Practice - Sultan Chand & Sons

Unit 4

Santhanam -Banking and Financial System, Margham Publications S.N.Maheshwari -Banking Law Theory and Practice, Kalyani Publishers Gurusamy -Banking Theory Law and Practices — Vijay Nicole Imprints (P) Ltd.

Unit 5

Santhanam -Banking and Financial System, Margham Publications S.N.Maheshwari -Banking Law Theory and Practice, Kalyani Publishers Gurusamy -Banking Theory Law and Practices — Vijay Nicole Imprints (P) Ltd.

Reference Items: Books and Journal

- 1. Kandasami K P- Banking Law and Practice
- 2. Varshney and Malhotra Principles of Banking Sultan Chand & Sons

E-Materials

- <u>https://www.bookden.in/products/macmillan-book-ebook-principles-practices-of-banking</u>
- <u>https://www.freebookcentre.net/business-books-download/Banking-principles-and-practice.html</u>
- <u>https://gurukpo.com/Content/BBA/fundamental_of_Banking.pdf</u>

Course Outcome

- After studied unit-1, student will be able to learn the Origin of Banks Definition of Bank - Types of Bank - Banking Systems - Unit Bank - Merits of Unit Bank -Demerits of Unit Banks - Branch Bank - Its merits and demerits - Financial System -Components of financial system.
- After studied unit-2, student will be able to know the Concept of Social Responsibility of Banks - Role of banks in Primary, Secondary and Territory sector - Mixed Banking - Retail Banking - Wholesale Banking - Universal Banking.
- After studied unit-3, student will be able to understand the roles of various banks: Reserve bank of India (central bank) - Commercial Banks - Cooperative Banks - flow of cooperative funds - Urban Cooperative Bank - Land Development Banks -Development Bank - NABARD (National Bank for Agriculture and Rural Development) - Regional Rural Bank - EXIM bank
- 4. After studied unit-4, student will be able to understand the Functions of Modern Commercial Banks - Savings account - Current account - Difference between savings account and current account - Fixed Deposit - Recurring Deposit - Granting of Loan -Clean Loan - Second loan - Overdraft -Cash Credit
- 5. After studied unit-5, student will be able to learn various financial services in the economy including Factoring Lease Finance Export Finance Credit Card Credit Rating E-business E-commerce E-banking Automatic Teller Machines.

ALLIED – 1 PAPER –2 3. FUNDAMENTALS OF COMPUTER

Course Objectives

- 1. To know the importance of computers, their types and uses.
- 2. To understand the Computer Architecture and various components of a computer system
- 3. To learn computers input-output devices and display devices
- 4. To know what a computer program is, its development, basic steps involved developing a computer program, Computer Languages and the Software.
- 5. To know the basics of connecting electronic devices, internet and computer virus

UNIT-I

Introduction - Characteristics of computers – Five Generations of computers – Classification -Computer System - Uses of Computers .

UNIT-II

Computer Architecture - CPU - Memory - Communication between various units of a computer system - Storage Devices - Magnetic Tape - Magnetic Disk - Optical Disk - CD/ROM.

UNIT-III

Input Devices - Types - keyboard - Mouse - Output Devices - Classification of Output - Printers - Plotters - Monitors.

UNIT-IV

Computer program - Developing a Program - Algorithm - Flowchart Program Testing and Debugging - Program Documentation - Types of Documentation - Characteristics of a good program - Computer Languages - Software.

UNIT-V

Internet basics - Basic internet terms - Getting connected to internet - Internet applications - Electronic Mail - How e-mail works - Searching the Web - Internet and Viruses.

Text Books

Unit 1

Kritka Gupta, Sunil Chauhan, Akash Saxena – Fundamentals of Computer – Laxmi Publication Pvt. Ltd Raja Raman – Fundamentals of Computer – Prentice Hall of India

Unit 2

Alex Leon and Mathews Leon –Computer Application in Business – Vijay Nicole Imprints Ltd., Kritka Gupta, Sunil Chauhan, Akash Saxena – Fundamentals of Computer – Laxmi Publication Pvt. Ltd

Unit 3

Raja raman – Fundamentals of Computer – Prentice Hall of India P K Sinha – Fundamentals of Computer-BPH Publication

Unit 4

P K Sinha – Fundamentals of Computer-BPH Publication Arora,Ashok and Bansal Shefali –Computer Fundamentals –Excel Books

Unit 5

Alex Leon and Mathews Leon –Computer Application in Business – Vijay Nicole Imprints Ltd.

Kritka Gupta, Sunil Chauhan, Akash Saxena – Fundamentals of Computer – Laxmi Publication Pvt. Ltd

Reference Items: Books and Journal

1. Introduction to Computer Science, ITL Education Solutions Limited, Pearson Education.

E-Materials

- <u>https://www.academia.edu/14277811/Computer_Fundamental_for_BBA_B.Com_and_BCA</u>
- https://theintactone.com/2019/08/31/ccsubba-506-computer-fundamentals/

Course Outcome

- **1.** After studied unit-1, student will be able to characteristics of computers various generations of computers Classification Computer System Uses of Computers
- After studied unit-1, student will be able to computer architecture CPU Memory -Communication between various units of a computer system - Storage Devices -Magnetic Tape - Magnetic Disk - Optical Disk - CD/ROM.
- 3. After studied unit-1, student will be able to learn Input Devices Types keyboard Mouse Output Devices Classification of Output Printers Plotters Monitors.

- 4. After studied unit-1, student will be able to computer program Developing a Program Algorithm Flowchart Program Testing and Debugging Program Documentation Types of Documentation Characteristics of a good program Computer Languages Software.
- 5. After studied unit-1, student will be able to know the basic internet terms Getting connected to internet Internet applications Electronic Mail How e-mail works Searching the Web Internet and Viruses

ANNAMALAI UNIVERSITY

ENVIRONMENTAL STUDIES

SYLLABUS

(For all UG Degree Courses)

(2021-2022) SEMESTER I

UNIT-I: INTRODUCTION TO ENVIRONMENTAL SCIENCES: NATURAL RESOURCES :

Environmental Sciences - Relevance - Significance - Public awareness - Forest resources - Water resources - Mineral resources - Food resources - conflicts over resource sharing - Exploitation - Land use pattern - Environmental impact - fertilizer - Pesticide Problems - case studies.

UNIT-II: ECOSYSTEM, BIODIVERSITY AND ITS CONSERVATION:

Ecosystem - concept - structure and function - producers, consumers and decomposers - Food chain - Food web - Ecological pyramids - Energy flow - Forest, Grassland, desert and aquatic ecosystem.

Biodiversity - Definition - genetic, species and ecosystem diversity - Values and uses of biodiversity - biodiversity at global, national (India) and local levels - Hotspots, threats to biodiversity - conservation of biodiversity - Insitu & Exsitu.

UNIT-III: ENVIRONMENTAL POLLUTION AND MANAGEMENT

Environmental Pollution - Causes - Effects and control measures of Air, Water, Marine, soil, solid waste, Thermal, Nuclear pollution and Disaster Management -Floods, Earth quake, Cyclone and Land slides. Role of individuals in prevention of pollution - pollution case studies.

UNIT-IV: SOCIAL ISSUES - HUMAN POPULATION

Urban issues - Energy - water conservation - Environmental Ethics - Global warming -Resettlement and Rehabilitation issues - Environmental legislations - Environmental production Act. 1986 - Air, Water, Wildlife and forest conservation Act - Population growth and Explosion - Human rights and Value Education - Environmental Health - HIV/AIDS - Role of IT in Environment and Human Health - Women and child welfare - Public awareness - Case studies.

UNIT-V: FIELD WORK

Visit to a local area / local polluted site / local simple ecosystem - Report submission

REFERENCES

- 1. KUMARASAMY, K., A.ALAGAPPA MOSES AND M.VASANTHY, 2004. ENVIRONMENTAL STUDIES, BHARATHIDSAN UNIVERSITY PUB, 1, TRICHY
- 2. RAJAMANNAR, 2004, ENVIRONEMNTAL STUDIES, EVR COLLEGE PUB, TRICHY
- **3**. KALAVATHY,S. (ED.) 2004, ENVIRONMENTAL STUDIES, BISHOP HEBER COLLEGE PUB., TRICHY

அண்ணாமலைப் பல்கலைக்கழகம் இளநிலைப் பட்டப்படிப்பு

அடித்தளப் படிப்பு — பகுதி -1 தமிழ் முதலாமாண்டு — முதற்பருவம் 2021 - 2022

அலகு – 1 கவிதை 1. பாரதியார் நெஞ்சுபொறுக்கு திலையே... _ (7 பாடல்கள்) 2. பாரதிதாசன் 1. தமிழின் இனிமை _ 2. சங்கநாதம் மலரும் மாலையும் - 'கோவில் வழிபாடு' 3. கவிமணிதேசிய விநாயகம்பிள்ளை -தேன்மழை – 'தலைமை தாங்கும் தமிழ்' 4. கவிஞர் சுரதா _ ஆலாபனை – 'ஆறாவது அறிவு' 5. அப்துல் ரகுமான் 6. மு.மேத்தா தேசப் பிதாவுக்கு ஒரு தெருப்பாடகனின் அஞ்சலி _ 7. நா.தனராசன் அந்தகிராமத்து மனிதன் - 'தூய்மை மலரட்டும்' -8. சுகிர்தராணி சிறப்பு மண்டலம் - எங்கள் வளநாடு 9. மாலதி மைத்ரி _ அகதி அலகு -2 உரைநடை

1.	ரா.பி.சேதுப்பிள்ளை	-	வாழ்க்கையும் வைராக்கிய		
2.	மயிலை சீனி வேங்கடசாமி	-	பழங்காலத்து	அணிகலன்கள்	

அலகு -3 நாடகம்

1. அறிஞர் அண்ணா-பாரதம்2. ஆறு. அழகப்பன்-கொல்லிப்பாவை

அலகு -4 சிறுகதை

1.	நாற்காலி	-	கி. ராஜநாராயணன்
2.	ഖണഖ.துரையன்	-	சேலத்தார் வண்டி

அலகு -5 மொழித்திறன்

- 1. அடிப்படை இலக்கணம் பெயர்ச்சொல், வினைச்சொல் அறிதல்
- 2. ண-ன-ந, ல-ள-ழ, ர-ற வேறுபாடு அறிதல்
- 3. கலைச் சொல்லாக்கம்
- 4. பிறமொழிச் சொல் நீக்கித் தமிழ்ச்சொல் அறிதல்

இலக்கிய வரலாறு

பாடப்பகுதியை ஒட்டிய இலக்கிய வரலாறு : 20-ஆம் நூற்றாண்டுக் கவிஞர்கள் கவிதை, உரைநடை, நாடகம், சிறுகதை ஆகிய இலக்கியங்களின் வளர்ச்சி நிலை.

இளநிலைப் பட்டப்படிப்பு

அடித்தளப் படிப்பு — பகுதி -1 தமிழ் முதலாமாண்டு — இரண்டாம் பருவம் 2020 — 2021

அலகு	– 1 கவிதை		
1.	திருநாவுக்கரசர்	-	திருவதிகை பதிகம் (கூற்றாயினவாறு விளக்களீா் - முதல் 5 பாடல்கள்)
2.	மாணிக்கவாசகர்	-	அச்சோபதிகம் (முக்தி நெறியே அறியாத – முதல் 5 பாடல்கள்)
3.	திருமூலர்	-	கல்வி (முதல் 5 பாடல்கள்)
அலகு	-2		
1.	ஆண்டாள்	-	நாச்சியார் திருமொழி (கற்பூரம் நாறுமோ – எனத் தொடங்கும் 5 பாடல்கள் மட்டும்)
2.	குலசேகராழ்வார்	-	பெருமாள் திருமொழி (4-ஆம் திருமொழி)
3.	நம்மாழ்வார்	-	உயர்வர உயர்நலம் உடையவன் (எனத் தொடங்கும் 5 பாடல்கள்)
ക്കരം	-3		
1.	- பலபட்டடை சொக்கநாதப்புலவர்	-	அழகர் கிள்ளை விடு தூது
2.	ெஜயங்கொண்டார் ஜெயங்கொண்டார்	-	கலிங்கத்துப்பரணி (கடைத்திறப்பு)
3.	முக்கூடற்பள்ளு	-	ஏசல்
அலகு	-4		
1.	கண்ணதாசன்	-	ஏசுகாவியம் (ஊதாரிப்பிள்ளை)
2.	குணங்குடி மஸ்தான் சாகிபு	-	மஸ்தான் சாகிபு பாடல்கள் பரா பரக்கண்ணி (1-40 கண்ணிகள்)
3.	பட்டினத்தார் பாடல்கள்	-	திருவிடை மருதூர் (காடே திரிந்து – எனத் தொடங்கும் பாடல் பா.எண்.279, 280)
அலகு	-5		

1. நோ்காணல்

- 2. நாளிதழுக்கு அறிக்கைத் தயாரித்தல்
- 3. பாடப்பகுதியைஒட்டிய இலக்கிய வரலாறு

சைவ, வைணவ சமய இலக்கியங்கள், கிறிஸ்துவமும் தமிழும், இஸ்லாமியமும் தமிழும்.

இளநிலைப் பட்டப்படிப்பு

அடித்தளப் படிப்பு – பகுதி -1 தமிழ் இரண்டாமாண்டு – மூன்றாம் பருவம் 2020 - 2021

அலகு – 1 திருக்குறள்

- 1. வான்சிறப்பு
- 2. வாழ்க்கைத் துணை நலம்
- 3. நட்பு
- 4. ஒழுக்கமுடைமை
- 5. பொழுது கண்டு இரங்கல்

அலகு -2

சிலப்பதிகாரம்

மதுரைக் காண்டம் - அடைக்கல காதை

மணிமேகலை

ஆபுத்திரன் திறம் அறிவித்த காதை பதிமூன்றாவது காதை

அலகு -3

சீவகசிந்தாமணி

நாமகள் இலம்பகம் ஏமாங்கத நாடு வர்ணனை

கம்பராமாயணம்

மந்தரை சூழ்ச்சி படலம் அயோத்திய காண்டம்

அலகு -4

பெரியபுராணம் - மெய்ப்பொருள் நாயனார் புராணம் சீறாப்புராணம் - விடம் மீட்ட படலம் இரட்சண்ய யாத்திரிகம் - சிலுவைப் பாடுகள்

அலகு -5

மொழித்திறன்

- 1. விண்ணப்பம் எழுதுதல்
- 2. தன் விவரக் குறிப்பு எழுதுதல்

இலக்கிய வரலாறு

புதினெண்கீழ்க்கணக்கு நூல்களில் அற இலக்கியங்கள் காப்பிய இலக்கியங்கள்.

இளநிலைப் பட்டப்படிப்பு

அடித்தளப் படிப்பு – பகுதி -1 தமிழ் இரண்டாமாண்டு – நான்காம் பருவம் 2020 - 2021

அலகு – 1

- 1. குறுந்தொகை திணைக்கு 1 பாடல் வீதம் 5 பாடல்கள் (3, 7, 145, 275, 364)
- 2. நற்றிணை திணைக்கு 1 பாடல் வீதம் 5 பாடல்கள் (72, 110, 216, 238, 310)
- 3. ஐங்குறுநூறு வேட்கைப் பத்து

அலகு -2

1.	புறநானூறு	-	(பாடல்கள் - 114, 138, 163, 204, 205)
2.	பதிற்றுப்பத்து	-	(ஐந்தாம் பத்து பாடல்கள் - 42, 45)

அலகு -3

1.	கலித்தொகை -	- மு நெ	ல்லைக 5ய்தற்ச	க்கலி 5லி (ட	பாட ராடல் -	.ல் எண் ⊷136)	.111)	
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2. பரிபாடல் - திருமால் - 1 : 36 – 73 வையை – 6 : 1 – 24

அலகு -4

பத்துப்பாட்டு - குறிஞ்சிப்பாட்டு (முழுவதும்)

அலகு -5

சங்க இலக்கிய வரலாறு

- 1. எட்டுத்தொகை நூல்கள்
- 2. பத்துப்பாட்டு நூல்கள்.