Sadakathullah Appa College

(Autonomous)

(Reaccredited by NAAC at an 'A' Grade and ISO 9001:2015 Certified Institution)

Rahmath Nagar, Tirunelveli – 627 011, Tamil Nadu.

DEPARTMENT OF CHEMISTRY

CBCS SYLLABUS

For

B.Sc. Chemistry

(Applicable for students admitted in June 2019 and onwards)
(As per the Resolutions of the Academic Council Meetings held on 03-03-2018, 17-10-2018 and 02-03-2019).

CONTENTS

B.Sc. Chemistry (2018– 2021)
Allied (i) With Physics and Mathematics ii) With Physics and Biochemistry)
(Applicable for students admitted in June 2019 and onwards)

DISTRIBUTION OF CREDITS, NO. OF PAPERS & MARKS

Part	Course	Semester	Hours	Credits	Papers	Marks
I	Tamil / Arabic	I to IV	24	16	4	400
II	English	I to IV	24	16	5	400
III	Discipline Specific Core (DSC) + Project+Practicals	I to VI	78	62	20	1800
	Discipline Specific Elective (DSE)	III to VI	16	16	4	400
	Allied Theory + Practicals	I to IV	24	16	6/8	500/ 600
IV	Non-major Elective (NME)	III & IV	4	4	2	200
	Skill Enhancement Course (SEC)	V & VI	4	4	2	200
	Skill Based Common (SBC)	VI	2	2	1	100
	Ability Enhancement Compulsory Course (AECC) Environmental Studies (EVS)	I	2	2	1	100
	Value Education (VE)	II	2	2	1	100
V	Extension Activities	I to IV+	--	1+1*	1	100
	MOOC[$]	I – V	-	2#		
		TOTAL	**180**	**141+1*+2#**	**47/49**	**4300/ 4400**

SEMESTER WISE DISTRIBUTION OF HOURS

Part	I	II	III				IV				Total
SEM	**T/A**	**ENG**	**DSC**	**PRO/ FW**	**DSE**	**AL**	**NME**	**SEC**	**SBC**	**EVS /VE**	
I	6	6	10	-	-	6	-	-	-	2	**30**
II	6	6	10	-	-	6	-	-	-	2	**30**
III	6	6	6	-	4	6	2	-	-	-	**30**
IV	6	6	6	-	4	6	2	-	-	-	**30**
V	-	-	24	-	4	-	-	2	-	-	**30**
VI	-	-	16	6	4	-	-	2	2	-	**30**
Total	**24**	**24**	**72**	**6**	**16**	**24**	**4**	**4**	**2**	**4**	**180**

+ Activities and evaluation are to be performed during Semesters I to IV and results to be declared at the end of the Semester IV along with those for other courses in the Mark Statement.
* Extra credit for Sadakath Outreach Programme (SOP)
[$] As per the guidelines of the UGC all the UG and the PG students shall enrol for one Massive Open Online Course offered through SWAYAM, NPTEL, etc.
Two extra credits will be given on completion of the course.

B.Sc. Chemistry (2018 – 2021) COURSE STRUCTURE (CBCS)
B.Sc. Chemistry (With Biochemistry & Physics Allied)
(Applicable for students admitted in June 2019 and onwards)
TITLE OF THE PAPERS, CREDITS & MARKS

I SEMESTER

P	SUB	TITLEOF THE PAPER	S.CODE	H/W	C	MARKS		
						I	E	T
I	TA 1	இக்காலத் தமிழ்	18ULTA11	6	4	25	75	100
	AR 1	Applied Grammar and Translation – I	18ULAR11					
II	EN 1	Prose, Poetry and Grammar-I	18ULEN11	4	2	20	30	50
		English for Communication	18ULEC11	2	2	20	30	50
III	DSC1	General Chemistry	18UCCH11	4	4	25	75	100
	DSC 2	Inorganic Chemistry-I	18UCCH12	4	4	25	75	100
	AI-1	Carbohydrates and Nucleic Acids	18UABC11	4	3	25	75	100
	DSCP I	Inorganic Quantitative Analysis	18UCCH1P1	2	1	40	60	100/2
	AI-P1	Analysis of Biomolecules-I	18UABC1P1	2	1	40	60	100/2
IV	EVS	Environmental Studies	18UENS11	2	2	25	75	100
			TOTAL	**30**	**23**			**700**

IISEMESTER

P	SUB	TITLEOF THE PAPER	S.CODE	H/W	C	MARKS		
						I	E	T
I	TA 2	சமயத் தமிழ்	18ULTA21	6	4	25	75	100
	AR 2	Applied Grammar and Translation – II	18ULAR21					
II	EN 2	Prose, Poetry and Grammar - II	18ULEN21	6	4	25	75	100
III	DSC 3	Organic Chemistry-I	18UCCH21	4	4	25	75	100
	DSC 4	Methodology of Practicals	18UCCH22	4	4	25	75	100
	AI-2	Metabolism and Enzymes	18UABC21	4	3	25	75	100
	DSCP II	Inorganic Quantitative Analysis & Organic Estimations	18UCCH2P1	2	1	40	60	100/2
	AI-P2	Analysis of Biomolecules-II	18UABC2P1	2	1	40	60	100/2
IV	VE	Value Education-I	18USVE2A	2	2	25	75	100
		Value Education-II	18USVE2B					
			TOTAL	**30**	**23**			**700**

III SEMESTER

P	SUB	TITLEOF THE PAPER	S.CODE	H/W	C	MARKS		
						I	E	T
I	TA 3	பயன்பாட்டுத் தமிழ்	18ULTA31	6	4	25	75	100
	AR 3	Applied Grammar and Translation-III	18ULAR31					
II	EN 3	One-Act Plays and Writing Skill	18ULEN31	6	4	25	75	100
III	DSC 5	Physical Chemistry-I	18UCCH31	4	4	25	75	100
	DSE1A	Polymer Chemistry	18UECH3A	4	4	25	75	100
	DSE1B	Material Science	18UECH3B					
	AII-1	Allied Physics-I	18UAPH31	4	3	25	75	100
	DSCP-III	Inorganic Qualitative Analysis of Simple Salt & Inorganic Preparation	18UCCH3P1	2	1	40	60	100/2
	AII-P1	Allied Physics Practical - I	18UAPH3P1	2	1	40	60	100/2
IV	NME-I	Water Management	18UNCH31	2	2	25	75	100
			TOTAL	**30**	**23**			**700**

IV SEMESTER

P	SUB	TITLEOF THE PAPER	S.CODE	H/W	C	MARKS		
						I	E	T
I	TA 4	சங்கத் தமிழ்	18ULTA41	6	4	25	75	100
	AR 4	*Classical Prose*	18ULAR41					
II	EN 4	A Practical Course in Spoken English	18ULEN41	6	4	25	75	100
III	DSC 6	Inorganic Chemistry-II	18UCCH41	4	4	25	75	100
	DSE2A	Chromatography	18UECH4A	4	4	25	75	100
	DSE2B	Dairy Chemistry	18UECH4B					
	AII2	Allied Physics – II	18UAPH41	4	3	25	75	100
	DSCP-IV	Inorganic Qualitative Analysis of mixture	18UCCH4P1	2	1	40	60	100/2
	AIIP-2	Allied Physics Practical - II	18UAPH4P1	2	1	40	60	100/2
IV	NME-II	Chemistry in Everyday life	18UNCH41	2	2	25	75	100
V	EX	Extension Activities (Choose from the list)	--	--	1	--	100	100
		SOP	18UEXSOP		1*			
			TOTAL	**30**	**24 + 1***	**---**	**----**	**800**

V SEMESTER

P	SUB	TITLEOF THE PAPER	S.CODE	H/W	C	MARKS		
						I	E	T
III	DSC 7	Physical Chemistry-II	18UCCH51	6	4	25	75	100
	DSC 8	Organic Chemistry-II	18UCCH52	5	4	25	75	100
	DSC 9	Inorganic Chemistry-III	18UCCH53	5	4	25	75	100
	DSE3A	Spectroscopy	18UECH5A	4	4	25	75	100
	DSE3B	Medicinal Chemistry	18UECH5B					
	DSCP V	Gravimetric Analysis& Chromatographic Technique	18UCCH5P1	4	2	40	60	100
	DSCP-VI	Preparation of organic Compounds	18UCCH5P2	4	2	40	60	100
IV	SEC-I	Industrial Chemistry	18USCH51	2	2	25	75	100
			TOTAL	**30**	**22**			**700**

VI SEMESTER

P	SUB	TITLEOF THE PAPER	S.CODE	H/W	C	MARKS		
						I	E	T
III	DSC 10	Physical Chemistry-III	18UCCH61	4	4	25	75	100
	DSC 11	Organic Chemistry-III	18UCCH62	4	4	25	75	100
	DSC 12	Project	18UCCH63	6	6	25	75	100
	DSE4A	Instrumental Methods of Analysis	18UECH6A	4	4	25	75	100
	DSE4B	Food Chemistry	18UECH6B					
	DSCP VII	Physical Chemistry and Computer in Chemistry	18UCCH6P1	4	2	40	60	100
	DSCP VIII	Organic Analysis	18UCCH6P2	4	2	40	60	100
IV	SEC-II	Pharmaceutical Chemistry	18USCH61	2	2	25	75	100
	SBC	Personality Development	18USPD62	2	2	25	75	100
			TOTAL	**30**	**26**			**800**
I-V sem		Massive Open Online Course $		-	2#			

B.Sc. Chemistry (2018-2021) (With Mathematics & Physics Allied)
(Applicable for students admitted in June 2019 and onwards)
TITLE OF THE PAPERS, CREDITS & MARKS

I SEMESTER

P	SUB	TITLE OF THE PAPER	S.CODE	H/W	C	MARKS		
						I	E	T
I	TA 1	இக்காலத் தமிழ்	18ULTA11	6	4	25	75	100
	AR 1	Applied Grammar and Translation – I	18ULAR11					
II	EN 1	Prose, Poetry and Grammar-I	18ULEN11	4	2	25	75	100/2
		English for Communication	18ULEC11	2	2	25	75	100/2
III	DSC1	General Chemistry	18UCCH11	4	4	25	75	100
	DSC 2	Inorganic Chemistry-I	18UCCH12	4	4	25	75	100
	AI-1	Statistics and Calculus	18UAMA11	6	4	25	75	100
	DSCP I	Inorganic Quantitative Analysis	18UCCH1P1	2	1	40	60	100/2
IV	EVS	Environmental Studies	18UENS11	2	2	25	75	100
			TOTAL	**30**	**23**			**650**

II SEMESTER

P	SUB	TITLE OF THE PAPER	S.CODE	H/W	C	MARKS		
						I	E	T
I	TA 2	சமயத் தமிழ்	18ULTA21	6	4	25	75	100
	AR 2	Applied Grammar and Translation – II	18ULAR21					
II	EN 2	Prose, Poetry and Grammar - II	18ULEN21	6	4	25	75	100
III	DSC 3	Organic Chemistry-I	18UCCH21	4	4	25	75	100
	DSC 4	Methodology of Practicals	18UCCH22	4	4	25	75	100
	AI-2	Algebra & Differential Equations	18UAMA21	6	4	25	75	100
	DSCP II	Inorganic Quantitative Analysis &Organic Estimations	18UCCH2P1	2	1	40	60	100/2
IV	VE	Value Education-I	18USVE2A	2	2	25	75	100
		Value Education-II	18USVE2B					
			TOTAL	**30**	**23**			**650**

III SEMESTER

P	SUB	TITLE OF THE PAPER	S.CODE	H/W	C	MARKS		
						I	E	T
I	TA 3	பயன்பாட்டுத் தமிழ்	18ULTA31	6	4	25	75	100
	AR 3	Applied Grammar and Translation-III	18ULAR31					
II	EN 3	One-Act Plays and Writing Skill	18ULEN31	6	4	25	75	100
III	DSC 5	Physical Chemistry-I	18UCCH31	4	4	25	75	100
	DSE1A	Polymer Chemistry	18UECH3A	4	4	25	75	100
	DSE1B	Material Science	18UECH3B					
	AII-1	Allied Physics-I	18UAPH31	4	3	25	75	100
	DSCP-III	Inorganic Qualitative Analysis of Simple Salt & Inorganic Preparation	18UCCH3P1	2	1	40	60	100/2
	AII-P1	Allied Physics Practical - I	18UAPH3P1	2	1	40	60	100/2
IV	NME-I	Water Management	18UNCH31	2	2	25	75	100
			TOTAL	**30**	**23**			**700**

IV SEMESTER

P	SUB	TITLE OF THE PAPER	S.CODE	H/W	C	MARKS		
						I	E	T
I	TA 4	சங்கத் தமிழ்	18ULTA41	6	4	25	75	100
	AR 4	*Classical Prose*	18ULAR41					
II	EN 4	A Practical Course in Spoken English	18ULEN41	6	4	25	75	100
III	DSC 6	Inorganic Chemistry-II	18UCCH41	4	4	25	75	100
	DSE2A	Chromatography	18UECH4A	4	4	25	75	100
	DSE2B	Dairy Chemistry	18UECH4B					
	AII2	Allied Physics - II	18UAPH41	4	3	25	75	100
	DSCP-IV	Inorganic Qualitative Analysis of mixture	18UCCH4P1	2	1	40	60	100/2
	AIIP-2	Allied Physics Practical - II	18UAPH4P1	2	1	40	60	100/2
IV	NME-II	Chemistry in Everyday life	18UNCH41	2	2	25	75	100
V	EX	Extension Activities (Choose from the list)	--	--	1	--	100	100
		SOP	18UEXSOP		1*			
			TOTAL	**30**	**24 + 1***	**---**	**----**	**800**

V SEMESTER

P	SUB	TITLE OF THE PAPER	S.CODE	H/W	C	MARKS		
						I	E	T
III	DSC 7	Physical Chemistry-II	18UCCH51	6	4	25	75	100
	DSC 8	Organic Chemistry-II	18UCCH52	5	4	25	75	100
	DSC 9	Inorganic Chemistry-III	18UCCH53	5	4	25	75	100
	DSE3A	Spectroscopy	18UECH5A	4	4	25	75	100
	DSE3B	Medicinal Chemistry	18UECH5B					
	DSCP V	Gravimetric Analysis& Chromatographic Technique	18UCCH5P1	4	2	40	60	100
	DSCP-VI	Preparation of organic Compounds	18UCCH5P2	4	2	40	60	100
IV	SEC-I	Industrial Chemistry	18USCH51	2	2	25	75	100
			TOTAL	**30**	**22**			**700**

VI SEMESTER

P	SUB	TITLE OF THE PAPER	S.CODE	H/W	C	MARKS		
						I	E	T
III	DSC 10	Physical Chemistry-III	18UCCH61	4	4	25	75	100
	DSC 11	Organic Chemistry-III	18UCCH62	4	4	25	75	100
	DSC 12	Project	18UCCH63	6	6	25	75	100
	DSE4A	Instrumental Methods of Analysis	18UECH6A	4	4	25	75	100
	DSE4B	Food Chemistry	18UECH6B					
	DSCP VII	Physical Chemistry and Computer in Chemistry	18UCCH6P1	4	2	40	60	100
	DSCP VIII	Organic Analysis	18UCCH6P2	4	2	40	60	100
IV	SEC-II	Pharmaceutical Chemistry	18USCH61	2	2	25	75	100
	SBC	Personality Development	18USPD62	2	2	25	75	100
			TOTAL	**30**	**26**			**800**
				180	**141+ 1***			**4300**

B.Sc. Chemistry (2018-2021) Course Structure (CBCS)
(Applicable for students admitted in June 2019 and onwards)

PART I AND PART II SUBJECTS

TITLE OF THE PAPERS, CREDITS & MARKS

GROUP II COURSES (TWO YEAR LANGUAGE COURSES) (, B.A. Arabic, B.A. Tamil, B.A. English, B.A. History, B.Sc. Mathematics, B.Sc. Physics, B.Sc. Chemistry, B.Sc. Zoology, B.Sc. Microbiology and B.Sc. Nutrition and Dietetics)							
SEM	**Title of the paper**	**S.CODE**	**H/W**	**C**	**I**	**E**	**T**
PART I – TAMIL							
I	இக்காலத் தமிழ்	**18ULTA11**	6	4	25	75	100
II	சமயத் தமிழ்	**18ULTA21**	6	4	25	75	100
III	பயன்பாட்டுத் தமிழ்	**18ULTA31**	6	4	25	75	100
IV	சங்கத் தமிழ்	**18ULTA41**	6	4	25	75	100
		TOTAL	**24**	**16**			**400**
PART I – ARABIC							
I	Applied Grammar and Translation – I	**18ULAR11**	6	4	25	75	100
II	Applied Grammar and Translation – II	**18ULAR21**	6	4	25	75	100
III	Applied Grammar and Translation – III	**18ULAR31**	6	4	25	75	100
IV	*Classical Prose*	**18ULAR41**	6	4	25	75	100
		TOTAL	**24**	**16**			**400**
PART II – ENGLISH							
I	Prose, Poetry and Grammar-I	**18ULEN11**	4	2	25	75	100/2
	English for Communication	**18ULEC11**	2	2	25	75	100/2
II	Prose, Poetry and Grammar-II	**18ULEN21**	6	4	25	75	100
III	One – Act Plays and Writing Skill	**18ULEN31**	6	4	25	75	100
IV	A Practical Course in Spoken English	**18ULEN41**	6	4	25	75	100
		TOTAL	**24**	**16**			**400**

PART III

Part III DSC, DSE, Project and SEC								
SEM	**No.**	**TITLE OF THE PAPER**	**S.CODE**	**H/W**	**C**	**MARKS**		
						I	**E**	**T**
I	DSC1	General Chemistry	18UCCH11	4	4	25	75	100
	DSC2	Inorganic Chemistry-I	18UCCH12	4	4	25	75	100
	CP 1	Inorganic Quantitative Analysis	18UCCH1P1	2	1	20	30	50
II	DSC3	Organic Chemistry-I	18UCCH21	4	4	25	75	100
	DSC4	Methodology of Practicals	18UCCH22	4	4	25	75	100
	CP 2	Inorganic Quantitative Analysis & Organic Estimations	18UCCH2P1	2	1	20	30	50
III	DSC5	Physical Chemistry-I	18UCCH31	4	4	25	75	100
	CP 3	Inorganic Qualitative Analysis of Simple Salt & Inorganic Preparation	18UCCH3P1	2	1	20	30	50
	DSE-I	Polymer Chemistry	18UECH3A	4	4	25	75	100
		Material Science	18UECH3B					
IV	DSC6	Inorganic Chemistry-II	18UCCH41	4	4	25	75	100
	CP 4	Inorganic Qualitative Analysis of mixture	18UCCH4P1	2	1	20	30	50
	DSE-II	Chromatography	18UECH4A	4	4	25	75	100
		Dairy Chemistry	18UECH4B					
V	DSC7	Physical Chemistry-II	18UCCH51	6	4	25	75	100
	DSC8	Organic Chemistry-II	18UCCH52	5	4	25	75	100
	DSC9	Inorganic Chemistry-III	18UCCH53	5	4	25	75	100
	CP 5	Gravimetric Analysis& Chromatographic Technique	18UCCH5P1	4	2	40	60	100
	CP 6	Preparation of organic Compounds	18UCCH5P2	4	2	40	60	100
	DSE-III	Spectroscopy	18UECH5A	4	4	25	75	100
		Medicinal Chemistry	18UECH5B					
VI	DSC10	Physical Chemistry-III	18UCCH61	4	4	25	75	100
	DSC11	Organic Chemistry-III	18UCCH62	4	4	25	75	100
	DSC12	Project	18UCCH63	6	6	25	75	100
	CP 7	Physical Chemistry and Computer in Chemistry	18UCCH6P1	4	2	40	60	100
	CP 8	Organic Analysis	18UCCH6P2	4	2	40	60	100
	DSE-IV	Instrumental Methods of Analysis	18UECH6A	4	4	25	75	100
		Food Chemistry	18UECH6B					
			TOTAL	**94**	**78**			**2200**

PART III – ALLIED I – MATHEMATICS & ALLIED – II PHYSICS

SEM	SUB	TITLE OF THE PAPER	S.CODE	H/W	C	MARKS		
						I	E	T
I	AI-1	Statistics and Calculus	18UAMA11	6	4	25	75	100
II	AI-2	Algebra & Differential Equations	18UAMA21	6	4	25	75	100
III	AII-1	Allied Physics – I	18UAPH31	4	4	25	75	100
	AII-P1	Allied Physics Practical	18UAPH3P1	2	1	20	30	50
IV	AII-2	Allied Physics – II	18UAPH41	4	3	25	75	100
	AII-P2	Allied Physics Practical	18UAPH4P1	2	1	20	30	50
		TOTAL		**24**	**16**			**500**

PART III – ALLIED I – BIO-CHEMISTRY& ALLIED – II PHYSICS

SEM	SUB	TITLE OF THE PAPER	S.CODE	H/W	C	MARKS		
						I	E	T
I	AI-1	Carbohydrates and Nucleic Acids	18UABC11	4	4	25	75	100
	AI-P1	Analysis of Biomolecules-I	18UABC1P1	2	1	20	30	50
II	AI-2	Metabolism and Enzymes	18UABC21	4	3	25	75	100
	AI-P2	Analysis of Biomolecules-II	18UABC2P1	2	1	20	30	50
III	AII-1	Allied Physics – I	18UAPH31	4	4	25	75	100
	AII-P1	Allied Physics Practical	18UAPH3P1	2	1	20	30	50
IV	AII-2	Allied Physics – II	18UAPH41	4	3	25	75	100
	AII-P2	Allied Physics Practical	18UAPH4P1	2	1	20	30	50
		TOTAL		**24**	**16**			**600**

Part IV – NON-MAJOR ELECTIVE COURSE (FOR OTHER MAJOR STUDENTS)

SEM	P	TITLE OF THE PAPER	S.CODE	H/W	C	MARKS		
						I	E	T
III	NME-I	Water Management	18UNCH31	2	2	25	75	100
IV	NME-II	Chemistry in Everyday life	18UNCH41	2	2	25	75	100
		TOTAL		**4**	**4**			**200**
		Part IV – SEC/SBC						
V	SEC-I	Industrial Chemistry	18USCH51	2	2	25	75	100
VI	SEC-II	Pharmaceutical Chemistry	18USCH61	2	2	25	75	100
VI	SBC	Personality Development	18USPD62	2	2	25	75	100
		TOTAL		**6**	**6**			**300**
		Part IV – EVS & Value Education						
I	EVS	Environmental Studies	18UENS11	2	2	25	75	100
II	VE	Value Education I	18USVE2A	2	2	25	75	100
		Value Education II	18USVE2B					
		TOTAL		**4**	**4**			**200**

PART – V – Extension Activities

SEM	Extension Activities (Choose any one)	S.CODE	H/W	C	MARKS		
					I	E	T
I to IV	NCC	18UEXNCC		1			100
	NSS	18UEXNSS					
	Physical Education	18UEXPHE					
	Red Ribbon Club	18UEXRRC					
	Youth Red Cross	18UEXYRC					
	Youth Welfare	18UEXYWL					
	Yoga	18UEXYOG					
III-IV	Sadakath Outreach Programme (SOP)	18UEXSOP		1*			
	Total		**-**	**1+1***			**100**

முதல்பருவம்			
PART - 1 TAMIL			
TA – 1	**இக்காலத்தமிழ்**		**18ULTA11**
Hrs/Week : 6	**Hrs/Sem : 90**	**Hrs/Unit : 18**	**Credits :4**

நோக்கம்

1. தமிழ்ப்படைப்பிலக்கியங்களான புதுக்கவிதைகள், சிறுகதைகள்ஆகியவற்றைஎழுத வைத்தல்
2. சமூகம் பற்றியசிந்தனைகளைப் படைப்பிலக்கியங்கள்மூலம் ஏற்படுத்துதல்.

அலகு - 1 தமிழ்க்கவிதைகள்

1. பரம்பொருள் வாழ்த்து - மகாகவிபாரதியார்
2. தமிழின் இனிமை - பாவேந்தர் பாரதிதாசன்
3. கொக்கு - ந.பிச்சமூர்த்தி
4. நான் - தருமு சிவராம் (பிரமிள்)
5. முக்காலம் - சி.மணி
6. தோழர் மோசிகீரனார் - ஞானக்கூத்தன்
7. நகுலன் கவிதைகள் - நகுலன்
8. எதிர்வரும் யாவரும் - கல்யாண்ஜி
9. ஆயிரம் திருநாமம் பாடி - கவிக்கோ அப்துல் ரகுமான்
10. மரங்களைப் பாடுவேன் - வைரமுத்து
11. இளைய தோழனுக்கு - மு.மேத்தா
12. செய்யுள் - கலாப்ரியா
13. பெயர் தெரியாப்பறவை - தேன்மொழிதாஸ்
14. நிசப்தத்தில் குளிரும் வார்த்தை - அனார்
15. முதல்துளி - பாலைவன லாந்தர்
16. இந்தக்காலம் - மனுஷ்யபுத்திரன்
17. பூவின் பதில் - நாகூர் ரூமி
18. அறிவுமதி கவிதைகள் - அறிவுமதி
19. வேர் பிடித்த மரம் - க.அம்சப்ரியா
20. நட்சத்திரக் கிழவி - ப.சுடலைமணி
21. கீதாஞ்சலி - மகாகவிஇரவீந்தரநாத் தாகூர்
22. ஜென் கவிதைகள் - பாஷோ

அலகு - 2 சிறுகதைஇன்பம்

1. விடியுமா? - கு.பா.ராஜகோபாலன்
2. காலனும் கிழவியும் - புதுமைப்பித்தன்
3. கதவு - கி.ராஜநாராயணன்
4. காலத்தின் ஆவர்த்தனம் - தோப்பில் முஹம்மது மீரான்
5. சொர்க்கக் கன்னிகை - கருணா மணாளன்
6. செடிகளுக்கு - வண்ணதாசன்
7. கனவில் உதிர்ந்த பூ - நாறும்பூநாதன்
8. சங்காத்தி - தீன்
9. ராஜமீன் - கீரனூர் ஜாகீர்ராஜா

அலகு -3 கட்டுரைக் கனிகள்

1. தமிழில் ஹைக்கூகவிதைகள்
2. கவிக்கோ அப்துல் ரகுமானின் கவிதைகள்
3. நாட்டுப்புற இலக்கியங்கள்
5. இணையத்தில் தமிழ்
6. தமிழ்ச் சிறுகதைஇலக்கியம்
7. இயற்கையைக் கொண்டாடும் ஜென் கவிதைகள்

அலகு - 4 இலக்கியவரலாறு

1. தமிழ்ப் புதுக்கவிதை தோற்றமும் வளர்ச்சியும்
2. தமிழ்ச் சிறுகதை தோற்றமும் வளர்ச்சியும்
3. தற்காலச் சிறுகதையாசிரியர்கள் ஓர் அறிமுகம்
4. புதுக்கவிதைகள் எழுதப்பயிற்சி தந்து மாணவர் கவிதைத் தொகுப்பை வெளியிடல்.

அலகு - 5 எழுத்து இலக்கணம் & எழுத்து வகைகள்அறிமுகம்

1. முதலெழுத்துகள், சார்பெழுத்துகள், சுட்டெழுத்துக்கள்,வினாவெழுத்துகள்
2. மொழி முதல் எழுத்துகள், மொழி இறுதி எழுத்துகள், வல்லினம் மிகுமிடங்கள், வல்லினம் மிகாவிடங்கள்.
3. நாளிதழ்களில் இடம்பெறும் செய்திகளில் பிழைகளைக் கண்டறிந்து எழுதப்பயிற்சி

பாடநூல்

"இன்பத்தமிழ்"
சதக்கத்துல்லாஹ்அப்பா கல்லூரித் தமிழ்த்துறை வெளியீடு
ரஹ்மத்நகர், திருநெல்வேலி& 627 011.

பார்வை நூல்கள்மற்றும் வழிகாட்டு இணையதளங்கள்

1. வல்லிக்கண்ணன்
   புதுக்கவிதை தோற்றமும் வளர்ச்சியும்
2. ந.சுப்புரெட்டியார்
   புதுக்கவிதை போக்கும் நோக்கம்
3. பேராசிரியர் சு.பாலசந்திரன்
   புதுக்கவிதை & ஒரு புதுப்பார்வை
4. எஸ். ராமகிருஷ்ணன்
   கதாவிலாசம்
   விகடன் பிரசுரம்
   757, அண்ணாசாலை
   சென்னை & 600 002.

இணையதளங்கள்

1. www.tamilvu.org
2. www.azhiyasudargal.blogspot.in
3. www.neelamegam.blogspot.in
4. www.jeyamohan.in
5. www.sramakrishnan.com

SEMESTER - I			
AR-1	**APPLIED GRAMMAR AND TRANSLATION-I**		**18ULAR11**
Hrs/ Week: 6	**Hrs/ Sem: 90**	**Hrs/ Unit: 18**	**Credits: 4**

Objectives: To enable the students to learn Alphabets,Pronunciation, Basic Grammar, Reading, Writing of Arabic Language

Unit I :- Lessons 1 to 4 (TEXTBOOK – 1)

من الدرس الأول إلى الدرس الرابع

Unit II :- Lessons 5 to 8 (TEXTBOOK – 1)

من الدرس الخامس إلى الدرس الثامن

Unit III :- Grammar Portions (TEXTBOOK – 2)

1) Words and the types of words **(أجزاء الكلام)**
2) Nominal Sentence**(الجملة الاسمية)**
3) Adjective and Noun-qualified**(الصفة والموصوف)**
4) Subject and Predicate
5) Masculine and Feminine**(المذكر والمؤنث)**
6) Interrogatives**(أدوات الاستفهام)**
7) Singular, Dual and Feminie**(المفرد والتثنية والجمع**
8) Possessivenes**(المضاف والمضاف إليه)**
9) Detached Pronouns **(الضمائر المنفصلة)**
10) Prepositions**(حروف الجر)**
11) Demonstrative pronouns**(أسماء الاشارة)**
12) Relative pronouns**(الأسماء الموصولة)**

Unit IV :- Lessons 9 to 12 (TEXTBOOK – 1)

من الدرس التاسع إلى الدرس الثاني عشر

Unit V :- Lessons 13 to 16 (TEXTBOOK – 1)

من الدرس الثالث عشر إلى الدرس السادس عشر

TEXTBOOKS

1. DuroosulLughatil Arabiya Part – I Lessons 1 to 16 only by Dr.V. Abdur Rahim.
   Available at: Islamic foundation Trust, 78 Perambur High Road, Perambur, Chennai- 600 012.
2. Arabic for Beginners (selected topics only)
   By Dr. Syed Ali (Former HOD of Arabic, The New College, Royappettach, (Chennai) (International Edition 2001) (UBS Publishers & Distributors Ltd) 5, Ansari Road New Delhi -110 002.

I SEMESTER Part – II English			
EN I A	**Prose, Poetry and Grammar - I**		**18ULEN11**
Hrs/ Week: 4	**Hrs/ Sem: 60**	**Hrs/ Unit: 12**	**Credits:2**

Objectives:

1. To answer comprehensive questions on passages of moderate level of difficulty.
2. To write a critical appreciation of the prescribed poems.
3. To write grammatically.

UNIT I PROSE

1. Education Provides a Solid Foundation - A.P. J. Abdul Kalam
2. Love Story - Maneka Gandhi

UNIT II PROSE

3. Speech on Indian Independence - Jawaharlal Nehru
4. Film-Making - Satyajit Ray

UNIT III POETRY

1. In the Bazaars of Hyderabad - Sarojini Naidu
2. Middle Age - Kamala Das

UNIT IV GRAMMAR

1. Parts of Speech : Verb
2. Tenses

UNIT V COMMUNICATION SKILLS

1. Unseen Passages
2. Letter Writing: Personal and Business Letters
3. Curriculum Vitae (CV)

TEXTBOOK:

1. Kulat L. Ambadas, Dr. Joshi, Sandeep. et. al. (ed). *Blooming Buds.*Hyderabad: Orient BlackSwan, 2017.

I SEMESTER			
EN I B	**ENGLISH FOR COMMUNICATION**		**18ULEC11**
Hrs/ Week: 2	**Hrs/ Sem: 30**	**Hrs/ Unit: 6**	**Credits:2**

Objectives:

1. To teach students basic Grammatical categories.
2. To teach students the four skills viz. Listening, Speaking, Reading and Writing
   and to impart language skills through tasks.
3. To inculcate in students the skills necessary for social and academic circumstances.

UNIT I

Parts of Speech (Pages 5 to 17)

UNIT II

Listening and Speaking (Pages 22 to 34) and (56 to 59)

UNIT III

Reading (Pages 35 to 45)

UNIT IV

Writing - I
Punctuation and Kinds of Sentences (Pages46 to 55)

UNIT V

Writing - II
Filling in Forms & Wrap-up (Pages 60 to78)

TEXTBOOK:

1. Board of Editors. *Content and Language Integrated Learning to Enhance Communication Skills. Semester I Module 1.* Chennai: Tamil Nadu State Council for Higher Education, 2017.

PART III –Discipline Specific Core DSC+DSE+ Allied + Project + Practical			
I SEMESTER			
DSC 1	**GENERAL CHEMISTRY**		**18UCCH11**
Hrs/Week: 4	**Hrs / Sem: 60**	**Hrs / Unit: 12**	**Credit:4**

UNIT I - Periodic Table

Long form of Periodic Table - merits and demerits - variation of periodic properties (atomic radii, ionic radii, ionization potential, electro negativity and electron affinity) of elements in periods and groups.Different scales of electronegativity (Pauling, Mulliken Scale, Alfred and Rochow's Scale), Application of electro negativity.Inert pair effect.Classification of elements on the basis of their electronic configurations.

UNIT II - Atomic Structure (Wave Mechanical Approach)

Dual nature of matter, de - Broglie equation - verification using Davisson and Germer experiment. Heisenberg uncertainty principle - Compton Effect - Schrodinger wave equation (derivation not required) - significance of ψ^2 - Eigen value and Eigen function. Shapes of s, p and d - orbitals.Nodalplane.Quantum Numbers and its significances.Pauli's exclusion principle, Hund's rule and Aufbau principle.

UNIT III - Chemical Bonding

Covalent bond - Atomic Orbital theory of covalent bond - polarity of covalent bonds - Fajans rule. Molecular Orbital theory - LCAO method - Rules for linear combination of atomic orbitals. Molecular orbital treatment for homonuclear diatomic molecules (H_2, N_2, F_2, O_2 and He_2) and heteronuclear diatomic molecules CO, HF and NO - Bond order and magnetic properties. Basic concept and applications of hydrogen bonding

UNIT IV - Shape of Molecules

VSEPR Theory - postulates, applications to simple molecules such as $BeCl_2$, BF_3, CH_4, NH_3 and H_2O and ClF_3. Hybridization and geometry of sp^3(CH_4), sp^3d (PCl_5), sp^3d^2(SF_6) and sp^3d^3(IF_7)Shapes and structures of the following molecules $SF_4$and XeF_4. Odd electron bond in B_2H_6(3C - $2e^-$ bond).

UNIT V - Oxidation and reduction

Electronic concept of oxidation and reduction.Oxidation number - assigning oxidation number - Redox reaction - Half reaction. Oxidant - Fe (III), hydrogen peroxide and potassium permanganate and their reduction half reaction. Reductant - Fe (II), oxalic acid and KI and their oxidation half reactions. Disproportionation reactions of MnO_4^{2-} in acid medium. Methods of balancing redox reactions: ion - electron and oxidation number method (only in acid medium).

REFERENCE BOOKS:

1. Advanced Inorganic Chemistry Volume I – Sathya Prakash and R. D. Madan, 2005; S.Chand and Company, New Delhi.
2. General and Inorganic Chemistry Volume I - R.Sarkar2005; New central Book Agency, Kolkata.
3. TEXTBOOK of Inorganic Chemistry - P. L. Soni and M. Katyl, 2004; Sultan Chand & Sons, New Delhi.
4. Atomic structure and chemical bonding - Manas Chanda, 2006; Tata McGraw Hill Publishing Company, New Delhi.
5. Theoretical Principles of Inorganic Chemistry - G. S. Manku, 2004; Tata McGraw Hill publishing company, New Delhi.

I SEMESTER			
DSC 2	**INORGANIC CHEMISTRY - I**		**18UCCH12**
Hrs / Week: 4	**Hrs / Sem: 60**	**Hrs / Unit: 12**	**Credit: 4**

UNIT I - Concepts of Acids and Bases

Arrhenius concept of acids and bases and its limitation - Lowry - Bronsted concept - Lux Flood concept, Lewis Acid Bases theory - Usanovich concept - Dual behavior of Water, relative strength of acids and bases - Pearson's Hard and Soft acid and bases principles - Relative order of the acidity of halogen acids (HF, HCl, HBr and HI).

UNIT II: Solvents

Solvents – Aqueous & non aqueous solvents – Water as a Universal solvent. Reaction in Non-aqueous solvents: Classification of solvents - Characteristics of a solvent - Dielectric constant, dipole moment and solvation.

Liquid Ammonia - Solubility of various substance (organic compounds, inorganic salts, non - metals and metals) in liquid ammonia. Advantages and disadvantages of liquid ammonia as solvent - Auto ionization - Ammono acids and bases – Reactions of Liq. Ammonia - Precipitation, Neutralization, Solvolysis, complex formation and redox reaction.

Liquid sulphur dioxide: Solubility of various substances - Auto ionization, precipitation, neutralization, solvolysis, complex formation and redox reactions.

UNIT III - s - block elements

General characteristics of IA and IIA group elements. Diagonal relationship of Lithium with Magnesium.Anomalous behavior of Lithium and Beryllium.Extraction of Lithium and Beryllium. Manufacture of Sodium carbonate (washing soda) by electrolytic process - properties and uses. Manufacture of Sodium bicarbonate (Baking soda) - properties and uses.

UNIT IV – Hydrogen and Oxygen compounds

Hydrogen - nascent hydrogen - atomic hydrogen - active hydrogen - *ortho* and *para* hydrogen - occluded hydrogen.

Heavy water - preparation - properties - uses.

Hydrogen peroxide – Manufacture, reaction and uses - volume strength and estimation by permanganometric method - Structure of Hydrogen peroxide.

Ozone - preparation - Siemens and Brodies ozoniser – properties, structure and uses.

UNIT V - p - Block elements

General characteristics of p-block elements - Boron group elements – Preparation, uses and structure of anhydrous aluminum chloride. Carbon group elements - comparison of carbon and silicon - preparation, properties and uses of calcium carbide.Nitrogen group elements - preparation, properties and uses of sodium nitro prusside and silicon nitride. Preparation and uses of microcosmic salt, potassium pyroantimonate, tartaremetic and sodium bismuthate

REFERENCE BOOKS:

1. Advanced Inorganic Chemistry - Vol. I, II, - Gurdeep Raj, 1986; Goel Publishing House, New Delhi.
2. Advanced Inorganic Chemistry Vol I, II - Sathyaprakash and R. D. Madan, Revised reprint 2005; S. Chand and Company, New Delhi
3. Advanced Inorganic Chemistry - F. A. Cotton and Wilkinson, 2003; John Wiley & Sons. INC.,
4. Inorganic Chemistry - J. E. Huhey, E. A. Keiter and R. L. Keiter, 2007; Addison Wesley Publishing Company.
5. Concise Coordination Chemistry - R. Gopalan and V. Ramalingam, 2001; Vikas Publishing House, New Delhi.

PART III - ALLIED - I - BIOCHEMISTRY			
I SEMESTER			
AI - Allied-1	**CARBOHYDRATES AND NUCLEIC ACIDS**		**18UABC11**
Hrs / Week: 4	**Hrs / Sem: 60**	**Hrs / Unit: 12**	**Credit: 3**

UNIT I - CARBOHYDRATES I

Definition and classification of carbohydrates - Structure and reactions of monosacharides (pyranose structure) Glucose, fructose, Galactose - Mutarotation - Epimerisation - Interconversion of monosaccharide - D - Arabinose to D - Glucose and vice - versa. D - Glucose to D - fructose and vice - versa.

Qualitative test for glucose, fructose and galactose.

UNIT II - CARBOHYDRATES II

Disaccharides - Occurrence, Structure and reactions of maltose, lactose and sucrose (structural elucidation not required).

Qualitative test for lactose, maltose and sucrose.

Glycosides - Physiological significance - Amino sugars - Importance

Polysaccharides - Definition of homo and hetero polysaccharide. Occurrence, structure and applications of starch and cellulose - Heteropolysaccharides - occurrence, structure and uses of Hyaluronic acid & chondroitin sulphate.

UNIT III - AMINO ACIDS AND PROTEINS

Amino acids - Different classifications, Properties - Optical activity, isoelectric point &zwitter ion - Reaction due to amino group, carboxylic acid group - Action of heat on alpha, beta and gama amino acids. Triplet code for 20 amino acids.

Proteins - Classification of proteins based on shape, solubility, composition and biological function - Biological actions of proteins. Primary structure, (one method each for C - Terminal, N - Terminal amino acid analysis), Secondary, tertiary and quarternary structure of proteins.

UNIT IV - LIPIDS

Lipids - Definition, classification - Fatty acids - - Definition, classification - . Saturated, unsaturated and unusual fatty acids. - Essential Fatty acids - Functions and Physiological role - Triacylglycerol. - Physical and chemical properties - Acid number, Iodine number, Saponification number and R.M. value.

Cholesterol - structure, colour reaction, biochemical function and biological importance.

UNIT V – Nucleic Acids

Bases – Structure of Purine, Pyrimidine bases (occur in nucleic acids), nucleosides, nucleotides and deoxynucleotides. Genetic code – Watson and crick DNA structure.RNA – Different types (MRNA, tRNA & rRNA) and structure of mRNA and tRNA.

REFERENCE BOOKS:

1. Biochemistry - U. Satyanarayana & U. Chakrapani, 2008; Books and Allied (P) Ltd., Kolkata.
2. Biochemistry - L. Stryer, W.H. Freeman and Company, New York.
3. Biochemistry _ P.W. Kuchel and G.B. Ralstol, 2005; Schaum's Outlines, Tata McGraw Hill Publishing Company Ltd., New Delhi.

I SEMESTER			
AI-1	**STATISTICS AND CALCULUS**		**18UAMA11**
Hrs/Week: 6	**Hrs/Sem: 90**	**Hrs./ Unit : 18**	**Credits 4**

OBJECTIVES:

1. To enable the students to understand physical science by a knowledge of elementary calculus.
2. To introduce various statistical tools to satisfy the need of concept personals.

UNIT I: Measures of Central Tendency – simple average – Mean, Median & Mode – Geometrical mean and Harmonic mean.

UNIT II: Measures of dispersion range-quartile deviation-standard deviation and mean deviation – coefficient of variation.

UNIT III: Correlation and regression: Scatter diagram – Karl Pearson's Coefficient of Correlation – properties –Rank Correlation- lines of regression - regression coefficient and properties.

UNIT IV: Pedal equations - Curvature – Radius of Curvature in Cartesian, parametric & polar co-ordinates – Evolute -Circle and centre of curvature.

Unit V: Beta and Gamma functions

TEXTBOOKS:

1. Statistics by S. Arumugam and Isaac, New Gamma Publications
2. Calculus by S.Arumugam and Isaac, New Gamma Publications

Unit I : TB 1: Chapter II Section 2.1 - 2.4
Unit II : TB 1: Chapter III Section 3.1
Unit III :TB 1: Chapter VI Section 6.1 – 6.3
Unit IV :TB 2 Part I Chapter III Section 3.3 – 3.5
Unit V :TB 2: Part II Chapter IV

REFERENCE BOOK:

1. Probability and Statistics by Joseph A. MangaladossPresi—Persi Publication
2. Calculus Volume I&II by S. Narayanan &T.K.Manicavachagam Pillay, S.Viswanathan.

I SEMESTER		
DSCP I	**INORGANIC QUANTITATIVE ANALYSIS**	**18UCCH1P1**
Hrs / Week: 2	**Hrs / Sem: 15 x 2 = 30**	**Credit: 1**

*** Examination at the end of I Semester**

VOLUMETRIC ESTIMATION:

A double titration involving the preparation of a primary standard, standardization of the link solution, making up of the given solution and its estimation.

Use of digital balance is permitted.

Acidimetry and alkalimetry

1. Estimation of H_2SO_4 – Std. oxalic acid. [Link-NaOH]
2. Estimation of NaOH – Std. Na_2CO_3. [Link – H_2SO_4 / HCl]
3. Estimation of Na_2CO_3 and $NaHCO_3$ by Walden's Method

Permanganometry

4. Estimation of sodium oxalate – Std. oxalic acid. [Link-$KMnO_4$]
5. Estimation of Fe^{2+}ion – Std. ferrous ammonium sulphate. [Link-$KMnO_4$]

Iodometry

6. Estimation of Copper – Std. $K_2Cr_2O_7$ [Link-Sodium Thiosulphate]

Dichrometry

7. Estimation of Ferrous ion by Internal Indicator
8. Estimation of Ferrous ion by External Indicator

Course Work:

9. Estimation of acetic acid in commercial vinegar
10. Estimation of Hydrogen peroxide.

REFERENCE BOOKS:

1. Vogel's textbook of Quantitative Inorganic Analysis - A. I. Vogel, (Longman), Pearson education, India.
2. Advanced Practical Chemistry - R. Mukhopadhyay and P. Chatterjee, 2007; Arunabha Sen, Books &Alied(P) Ltd., Kolkata.
3. Advanced Practical Chemistry - N. K. Vishnoi, 2005; Vikas Publishing House, New Delhi.
4. Advanced Course in Practical Chemistry - Ghoshal, Mahapatra &Nad, 2000; New Central Book Agency (P) Ltd., Kolkata.

I SEMESTER		
AI-P-1	**ANALYSIS OF BIOMOLECULES - I**	**18UABC1P1**
Hrs / Week: 2	**Hrs / Sem: 30**	**Credit: 1**

Qualitative analysis of carbohydrates

1. Analysis of monosaccharides – glucose, fructose and galactose.
2. Analysis of disaccharides - Maltose, lactose and sucrose.
3. Analysis of polysaccharides – Starch.

COURSE WORK

1. Qualitative analysis of monosaccharides (glucose, fructose, galactose) using paper chromatographic method.

II Quantitative analysis

1. Estimation of ascorbic acid (volumetric method)
2. Estimation of Acid number of Oil
3. Estimation of saponification number of Oil

COURSE WORK

1. Estimation of Iodine number of Oil

REFERENCE BOOKS:

1. Laboratory manual for Analytical Biochemistry & Separation Techniques- D.R. Palanivelu, 2000; School of Biotechnology, Madurai Kamaraj University, Madurai.
2. B.Sc., Biochemistry Practical Guide (EDOC) - Dept. of Chemistry, SadakathullahAppa College, Tirunelveli.
3. Practical Clinical Biochemistry Manual- T. Mary Vijaya, M.L. Mani, K. Sunitha Kumari & K.R.T. Asha, 2003; Rishi Publications, Kalikavilai.

I SEMESTER			
EVS	**ENVIRONMENTAL STUDIES**		**18UENS11**
Hrs/ Week: 2	**Hrs/ Sem: 30**	**Hrs/ UNIT: 6**	**Credits:2**

UNIT - I: Nature of Environmental Studies

Goals, Objectives and guiding principles of environmental studies. Towards sustainable development - Environmental segments– Atmosphere, Hydrosphere, Lithosphere, Biosphere – definition. Pollution episodes -– Hiroshima – Nagasaki, - Bhopal gas Tragedy, Fukushima. Stone leprosy in Taj Mahal

UNIT - II: Natural Resources

Renewable and Non-Renewable resources - classification.

- Forest resources: Use and over - exploitation, Afforestation and deforestation.
- Water resources: Use and over - utilization and conservation of surface and ground water – Rainwater harvesting.
- Marine Resources: Fisheries and Coral reefs.
- Mineral resources: Use and exploitation - environmental impacts of extracting and using mineral resources.
- Food resources: Effects of modern agriculture fertilizers - pesticide problem.
- Energy resources: Growing energy needs - use of alternate energy source - Solar cells & windmills.
- Land resources: Land degradation

UNIT - III: Ecosystem

- Concept of Eco-systems - Tropic level, food chains, food web and Ecological pyramids, Living conditions on other planets (Brief account).

  Types, structure & Functions of the following:

  a) Aquatic ecosystem
  b) Grassland ecosystem
  c) Forest ecosystem
  d) Desert ecosystem

UNIT - IV: Biodiversity & Its Conservation

Introduction - Definition: ecosystem diversity, species diversity and Genetic diversity. Hot spots of biodiversity - Western Ghats, Eastern

Himalayas and Gulf of Mannar.Threats to biodiversity - Habitat Loss, Poaching of wildlife and Man - wildlife conflicts.

Conservation of biodiversity: *In-situ* and *Ex-situ*.

UNIT - V: Environmental Pollution

Sources, effects, prevention and control measures of the following.

a) Air pollution: Composition of clean air, Global warming, Ozone layer depletion.
b) Water Pollution: Fresh water and Marine water.
c) Noise Pollution
d) Soil pollution

Biodegradable and Non Biodegradable wastes; Environmental Acts

- Air (prevention & Control of Pollution) Act.
- Environmental Protection Act
- Water (Prevention & Control of pollution) Act
- Environmental movements - Green peace and Chipco movement.
- Role of Central & State pollution Control Boards.

REFERENCE BOOKS:

1. Basic of Environmental Science. Vijayalakhmi, Murugesan and Sukumaran - ManonmaniamSundaranar University publications.
2. Environmental Studies. John de Brito, Victor, Narayanan and Patric Raja - published by St. Xavier's College, Palayamkottai, 2008.
3. Environmental Science and Biotechnology. A.G. Murugesan and C. Raja Kumar - MJP Publishers.
4. Fundamental of Environmental pollution - Krishnan Kannan - Chand & Company Ltd., New Delhi, 1997.
5. Environmental Studies. S. Muthiah, Ramalakshmi publications, Tirunelveli.
6. Environmental Studies. V.M. Selvaraj, Bavani Publications, Tirunelveli.

இரண்டாம் பருவம்			
PART - 1 TAMIL			
TA- 2	சமயத்தமிழ்		18ULTA21
Hrs/Week : 6	Hrs/Sem : 90	Hrs/Unit : 18	Credits :4

நோக்கம்

1. பலசமயக் கருத்துக்களை ஒப்பிட்டுச் சமயநல்லிணக்கத்தோடு வாழவழிகாட்டுதல்
2. தமிழ்நாடு அரசுப் பணியாளர் தேர்வாணையத் தேர்வுக்கு மாணவர்களை ஆயத்தப்படுத்துதல்.

அலகு & 1தமிழ்ச் செய்யுள் (துறை வெளியீடு)

சைவம்

1. அ. திருநாவுக்கரசர் - மாசில் வீணையும்...
   - நாமார்க்கும் குடியல்லோம்...
   - அப்பன் நீ அம்மை நீ
   ஆ. திருஞானசம்பந்தர் - தோடுடைய செவியன்...
   - வேயுறு தோளிபங்கன்
   - மருந்தவை மந்திரம்...
   இ. சுந்தரமூர்த்தி நாயனார் - பித்தா பிறைசூடி...
2. திருவாசகம் &மாணிக்கவாசகர் - பால் நினைந்தூட்டும்....
3. திருவெம்பாவை - ஆதியும் அந்தமும் இல்லா...
4. திருமந்திரம் & திருமூலர் - ஒன்றே குலமும் ஒருவனே தேவனும்

வைணவம்

5. அ. பொய்கையாழ்வார் - வையம் தகளியா...
   ஆ. பூதத்தாழ்வார் - அன்பேதகளியா...
   இ. பேயாழ்வார் - திருக்கண்டேன்..
6. திருப்பாவை &ஆண்டாள் - மார்கழித் திங்கள்...

சமணம்

7. வளையாபதி - மக்கட் செல்வம்

பௌத்தம்

8. புத்தபிரான் - மு.ரா.பெருமாள்

கிறித்தவம்

9. இயேசு காவியம் (மலைப் பொழிவு) முதல் நான்கு பாடல்கள் - கண்ணதாசன்

இஸ்லாம்

10. அல்லாஹ் - உமறுப்புலவர்
11. நபிகள்நாயக மான்மிய மஞ்சரி - சதாவதானிசய்குத்தம்பிபாவலர் (குறிப்பிட்டபாடல்கள்)
12. குணங்குடி மஸ்தான் பாடல்கள் - பாசக்கயிற்றுவலை
13. ஞானப்புகழ்ச்சி - தக்கலை பீர்முகம்மது அப்பா
14. அலகிலா அருளும் - இறையருட் கவிமணி கா. அப்துல்கபூர்

நீதிஇலக்கியம்

15. திருக்குறள் - ஒழுக்கமுடைமை

13. நாலடியார் - கல்விகரையில்

அலகு - 2 புதினம்

வாடிவாசல் - சி.சு.செல்லப்பா,
காலச்சுவடு பதிப்பகம், நாகர்கோவில்

அலகு - 3 உரைநடை (தமிழ்த்துறை வெளியீடு)

போட்டித் தேர்வுகளுக்குக் கட்டுரை எழுதும் பயிற்சி

1. தமிழ் இலக்கியத்தில் சமயநல்லிணக்கச் சிந்தனைகள்
2. நபிகள்நாயகம் (ஸல்) அன்பின் தாயகம்
3. சதக்கத்துல்லாஹ்அப்பா அவர்களின் வாழ்வும் பணியும்
4. தமிழ் இலக்கியங்களில் மனிதநேயச் சிந்தனைகள்
5. தமிழ் இலக்கியத்தில் மதுஒழிப்புச் சிந்தனைகள்
6. சூஃபியச் சித்தாந்தமும் சித்தர்களும்

அலகு - 4

(போட்டித் தேர்வுத் தயாரிப்பு)

இலக்கியவரலாறு

1. சைவம், வைணவம், கிறித்தவம், இசுலாம் வளர்த்த தமிழ்
2. புகழ் பெற்றதமிழ் நூல்கள், நூலாசிரியர்கள்

அலகு - 5

தமிழ்நாடு அரசுப் பணியாளர் தேர்வாணையம் நடத்தும் போட்டித் தேர்வுக்குரிய பொதுத் தமிழ் இலக்கணப்பகுதி& ஓர் அறிமுகம்

1. வேர்ச் சொல்லைக் கண்டறிதல்
2. பெயரெச்சம், வினையெச்சம், முற்றெச்சம் பற்றிஅறிதல்
3. வினைத்தொகை, பண்புத்தொகை பற்றிஅறிதல்
4. வினைமுற்று, வினையாலணையும் பெயர் கண்டறிதல்
5. இரட்டைக்கிளவி, அடுக்குத் தொடர் அறிதல்
6. வேற்றுமைத் தொகையைக் கண்டறிதல்

பாடநூல்

நற்றமிழ், சதக்கத்துல்லாஹ்அப்பா கல்லூரித் தமிழ்த்துறை வெளியீடு

வழிகாட்டு இணையதளங்கள்

1. www.noolulagam.com
2. www.tamilauthors.com
3. www.tnpsc.gov.in
4. www.tnpscexams.in
5. www.tamilvu.org

SEMESTER - II			
AR-2	**APPLIED GRAMMAR AND TRANSLATION-II**		**18ULAR21**
Hrs/ Week: 6	**Hrs/ Sem: 90**	**Hrs/ Unit: 18**	**Credits: 4**

Objectives: To make the students to develop the skill of basic Arabic Grammar and Translation skills from Arabic to English vice-versa.

Unit I:-Lessons 1 to 3 (TEXTBOOK – 1)

من الدرس الأول إلى الدرس الثالث

Unit II:-Lessons 4 to 6 (TEXTBOOK – 1)

من الدرس الرابع إلى الدرس السادس

Unit III :- Grammar Portions (TEXTBOOK – 2)

1) Inna and Its sisters(إن وأخواتها) 2) Elative(اسم التفضيل)

3) Perfect Tense (الفعل الماضي)4) Imperfect Tense(الفعل المضارع)

5) Doer and Object(الفاعل والمفعول) 6) Kaanaand Its sisters(كان وأخواتها)

7) Classification of Verb into Sound and weak verb(تقسيم الفعل إلى صحيح ومعتل)

8) Transitive and Intransitive verb (الفعل اللازم والمتعدي)9) Verbal Noun(المصدر)

Unit IV:-Lessons 7 to 9 (TEXTBOOK – 1)

من الدرس السابع إلى الدرس التاسع

Unit V:-Lessons 10 to 12 (TEXTBOOK – 1)

من الدرس العاشر إلى الدرس الثاني عشر

TEXTBOOKS

1) DuroosulLughatil Arabiya Part – II Lessons 1 to 12only by Dr.V. Abdur Rahim.

Available at: Islamic foundation Trust, 78 Perambur High Road, Perambur, Chennai- 600 012.

2) Arabic Tutor Part-I, II & III, By: Moulana Ebrahim Muhammad Karachi- DarulIshaat.

II SEMESTER			
EN2	**PART II ENGLISH Prose, Poetry and Grammar - II**		**18ULEN21**
Hrs/ Week: 6	**Hrs/ Sem: 90**	**Hrs/ Unit: 18**	**Credits: 4**

Objectives:

1. To answer comprehensive questions on a passage of moderate level of difficulty.
2. To write a critical appreciation of the prescribed poems and write sentences in English grammatically.

UNIT I PROSE

1. Appro JRD - Sudha Murthy
2. Packing - Jerome K. Jerome

UNIT II PROSE

3. How I Became a Public Speaker - G. B. Shaw
4. Values in Life - Rudyard Kipling

UNIT III POETRY

1. Money-Madness - D. H. Lawrence
2. No Men are Foreign - James Kirkup
3. On Another's Sorrow - William Blake

UNIT IV GRAMMAR

1. Subject-Verb Agreement
2. Verbs: Forms of 'to be', 'have', 'do'; modal auxiliaries

UNIT V COMMUNICATION SKILLS

1. Story Building
2. e-Communication: Fax; e-mail
3. Notices, Agendas and Minutes

TEXTBOOK:

1. Kulat L Ambadas, Dr. Joshi, Sandeep. et. al. (ed). *Blooming Buds*.Hyderabad: Orient Black Swan, 2017.

II SEMESTER			
DSC 3	**ORGANIC CHEMISTRY - I**		**18UCCH21**
Hrs / Week: 4	**Hrs / Sem: 60**	**Hrs / Unit: 12**	**Credit: 4**

UNIT I - IUPAC nomenclature and Types of Reaction

Concepts of Organic Chemistry: IUPAC nomenclature of organic compounds (Aliphatic and aromatic - Alkanes, Alkenes, Alkynes, Alcohols, Aldehydes, Ketones, Ether, Ester, Carboxylic acid, Amide, Amines, Cyano, Nitro and halo compounds) - Bicyclic compounds.

Bond Fission: Homolytic and Heterolytic cleavage - Electrophiles and nucleophiles. Types of Reactions: Addition, Substitution, Elimination, Condensation and Polymerization reactions.

UNIT II - Reaction intermediates and Polar Effects

Reaction intermediates: Formation, stability and structure of carbonium ions, carbanions, carbenes, nitrenes and free radicals.

Polar effects: Inductive effect, electromeric effect, mesomeric effect, hyper - conjugation and steric effect and their influence on the acidity and basicity of organic compounds.

UNIT III - Active Methylene Compounds & Tautomerism.

Active methylene compounds: Reactivity of methylene hydrogen - preparation and synthetic uses of diethyl malonate, ethyl acetoacetate, and ethyl cyanoacetate.

Tautomerism - definition - various types - keto - enol, amido - imido and nitro - acinitro tautomerisms - evidences in favour of each form and mechanism of inter conversion.

UNIT IV - Reagents of Synthetic Importance

Preparation and synthetic applications of Diazomethane, Lithium AluminiumHydride, Sodium borohydride,N-Bromosuccinimide,Sodamide, Selenium dioxide, Per-iodic acid, Osmium tetroxide, Grignard reagent, Methyl lithium and Diethyl zinc.

UNIT V - Cycloalkane and Aromaticity

Cycloalkane: Nomenclature - General methods of preparations, properties - Bayer's strain theory - Sachse - Mohr theory - Conformations of cyclohexane.

Aromaticity: Huckel's rule - examples for Aromatic, non-aromatic, anti-aromatic - examples for benzenoid and non - benzenoid compounds (tropylinium and cyclopropenyl ion). - Aromatic sextet theory based on resonance and MO theory.

REFERENCE BOOKS:

1. Modern Organic Chemistry - M. K. Jain and S. C. Sharma, 2005, Vishal Publishing Company, Jalandhar.
2. Advanced Organic Reactions Mechanism - N. Tewari,2005: Books and Allied (P) LTD, Kolkata.
3. Advanced General Organic Chemistry - S. K. Gosh, 2005, New Central Book Agency, Kolkata.
4. Organic Reaction Mechanism - R. K. Bansal, 2005, McGraw hill publishing company New Delhi.
5. Organic Reactions and Reagent - J. N. Gurtu and R. Kapoor, 2004, S. Chand and company, New Delhi.
6. Organic Synthesis – Jagdamba Singh and L.D.S. Yadav, 2007, Pragati Prakashan, Meerut.

II SEMESTER			
DSC4	**METHODOLOGY OFPRACTICALS**		**18UCCH22**
Hrs / Week: 4	**Hrs / Sem: 60**	**Hrs / Unit: 12**	**Credit: 4**

UNIT I -Principles of Qualitative Analysis

Flames - Oxidizing and reducing – Description of Pipette, Burette, graduated flaskand their calibration - Spot test plates.

Apparatus used in Semi-micro Analysis - Test tube, Centrifuge tube, Stirring rods, Dropper, Reagent bottles, Test tube holder, Centrifuge machine. Methodology used in Semi-micro Analysis heating, warming, evaporation, Precipitation of Cu^{2+}, Cd^{2+}, Ni^{2+} and $Zn^{2+}$with H_2S in acidic and basic medium. Determination of melting point and boiling point.

UNIT II - Qualitative Analysis

Preliminary tests for inorganic substances - physical examination, Charcoal cavity test, Flame test, Oxidizing fusion mixture test, Borax bead test, Preparation of original solution, Preparation of sodium fusion extract. Removal of interfering acid - radicals - Chromate, borate, oxalate, fluoride and phosphate.

UNIT III - Titrimetric Analysis

Introduction - Normality, Molality, Molarity (with simple problems), standard solution (primary and secondary), titrant, titrate, End point, Types of indicators - Internal, External, Self Adsorption. Types of reactions in volumetric analysis - Principle involved in acidimetry, alkalimetry, Iodometry, Iodimetry, Complexometry titration - Volumetric calculations.

UNIT IV - Gravimetric Analysis

Principle - Precipitation from homogenous solutions - organic precipitants - Co-precipitation, post-precipitation - Apparatus used in gravimetric analysis - stirring of liquids - filtration - desiccators and desiccants - crucible - Gravimetric steps involved in analysis -solution, precipitation, filtration, drying, ignition and incineration, weighing.

UNIT V - Theory of organic analysis

Preliminary examination - (Physical state, Colour, Odour, Flame test, Solubility test) - Detection of extra elements - Lassaigne's test for nitrogen, halogens and sulphur - Classification of organic compounds - Test for functional groups - Sodium carbonate test, Ester test, Neutral $FeCl_3$ test, Libermann's test, Schiff's reagent test, Tollen's test, 2, 4 - dinitrophenyl hydrazine test, Molisch test, Seliwanoff's test, Mulliken Barker test, Diazotisation reaction (Dye test).

Reference books:

1. An advanced course in Practical chemistry - Ghoshal Mahapatra &Nad, 2000; New Central Book Agency (P) Ltd., Kolkatta.
2. Vogel's Qualitative Inorganic Analysis, Revised by G.Svehla, 2009; Published by Dorling Kindersley Pvt.Ltd., New Delhi.
3. Advanced Practical Chemistry - R.Mukhopadhyay and P.Chatterje, 2007; Arunabha Sen Books &Alied(P) Ltd., Kolkata.
4. Advanced Practical Chemistry - N.K.Vishnoi, 2005; Vikas Publishing House, New Delhi.
5. A TEXTBOOK of Practical Organic Chemistry, including Qualitative Organic Analysis - A.I.Vogel (Longman), Pearson Education India.
6. University Practical Chemistry, P.C. Kamboj, 2010, Vishal Publishing Co., Punjab.

II SEMESTER			
AI- 2	**METABOLISM AND ENZYMES**		**18UABC21**
Hrs / Week: 4	**Hrs / Sem: 60**	**Hrs / Unit: 12**	**Credit: 3**

UNIT I - CONCEPTS OF METABOLISM

Basic concept of metabolism - Catabolism and anabolism.Study of metabolism - different approaches - Use of laboratory animals, isotopes, tissue slices and microorganisms.

UNIT II - CARBOHYDRATE METABOLISM

Embden - Meyerhof pathway (or) glycolysis - Significance and reactions - TCA cycle - Significance and reactions - HMP shunt, glycogenesis and glucogenesis .

UNIT III - METABOLISM OF AMINO ACID

General breakdown of proteins - deamination, transamination, decarboxylation - .Urea cycle - Metabolism of Glycine, Tyrosine and tryptophan - Kynurenine pathway - Serotonin pathway - Melatonin - Serotonin - functions.

UNIT IV - METABOLISM OF LIPIDS

Source of body fat - fatty acid oxidation - β oxidation - Source of CoA - Ketone bodies - Ketogenesis - Utilization - overproduction. Biosynthesis of fattyacids - Palmitate - Structure of fatty acid synthase complex.

UNIT V - ENZYMES

Enzymes - Nomenclature - Classification - Factors affecting the velocity of enzyme reaction - Michaelis - Menten equation - Derivation - Enzyme specificity - Enzyme inhibition - Reversible, Irreversible and Allosteric - Coenzymes - Mechanism of NAD' - Industrial and Medical applications of enzyme.

REFERENCE BOOKS:

1. Biochemistry - U. Satyanarayana & U. Chakrapani, 2008; Books and Allied (P) Ltd., Kolkata.
2. Biochemistry - LubertStryer, W.H. Freeman and Company, New York.
3. Biochemistry _ P.W. Kuchel and G.B. Ralstol, 2005; Schaum's Outlines, Tata McGraw Hill Publishing Company Ltd., New Delhi.

II SEMESTER			
AI-2	**ALGEBRA & DIFFERENTIAL EQUATIONS**		**18UAMA21**
Hrs/Week: 6	**Hrs/Sem: 6 x 15 = 90**	**Hrs/ Unit : 18**	**Credits 4**

OBJECTIVE:

- To enable the students to understand physical science by a knowledge of elementary calculus.

UNIT I: Theorems on theory of Equation – Relation between roots and coefficients – Symmetric functions of roots in terms of coefficients.

UNIT II: Transformation of Equations – Reciprocal Equations.

UNIT III: Approximate solutions of numerical equations using Newton's method and Horner's method.

UNIT IV: First order higher degree Differential equations - Solvable for p, x and y- Clairaut's form

UNIT V: Linear differential equation with constant coefficients- particular integrals of the form f(x) e^{ax}, x^n.

TEXTBOOK:

1. Classical Algebra by Joseph A. Mangaladoss, S. Firthous Fatima, M. HimayaJaleela Begum and Dr. Syed Ali Fathima, Presi – Persi Publications – Edition 2016.
2. Differential Equations & Applications by S. Arumugam and Issac, New Gamma Publications—Edition 2008.

Unit I : **TB 1** Chapter I: Section 1.1, 1.2 & Chapter II: Section 2.1.

Unit II : **TB 1** Chapter II: Section 2.2 & Chapter IV: Section 4.1-4.4

Unit III : **TB 1** Chapter V: Section 5.1, 5.2

Unit IV: **TB 2** Chapter I: Section 1.7

Unit V : **TB2** Chapter II: Section 2.3

REFERENCE BOOK:

1. Algebra by Arumugam and Issac, New Gamma Publications – Edition 2011.
2. Differential Equation & Vector Calculas by Joseph A. Mangaldoss, Presi – Persi Publications.

II SEMESTER		
DSCP II	**INORGANIC QUANTITATIVE ANALYSIS AND ORGANIC ESTIMATIONS**	**18UCCH2P1**
Hrs / Week: 2	**Hrs / Sem: 30**	**Credit: 1**

*** Examination at the end of II Semester**

VOLUMETRIC ESTIMATION:

A double titration involving the preparation of a primary standard, standardization of the link solution, making up of the given solution and its estimation.

Use of digital balance is permitted.

Complexometry

1. Estimation of Zn
2. Estimation of Ca
3. Estimation of Mg
4. Estimation of Mn
5. Estimation of Al
6. Estimation of Cu
7. Estimation of Ba [Course Work]

Organic Estimations

8. Estimation of Phenol
9. Estimation of Aniline
10. Estimation of Glucose [Course Work]

REFERENCE BOOKS:

1. Vogel's TEXTBOOK of Quantitative Inorganic Analysis - A. I. Vogel, (Longman), Pearson education, India.
2. Advanced Practical Chemistry - R. Mukhopadhyay and P. Chatterje, 2007; Arunabha Sen, Books &Allied(P) Ltd., Kolkata.
3. Advanced Practical Chemistry - N. K. Vishnoi, 2005; Vikas Publishing House, New Delhi.
4. Advanced Course in Practical Chemistry - Ghoshal, Mahapatra &Nad, 2000; New Central Book Agency (P) Ltd., Kolkata.

II SEMESTER		
AI-P-2	**ANALYSIS OF BIOMOLECULES - II**	**18UABC2P1**
Hrs / Week: 2	**Hrs / Sem: 30**	**Credit: 1**

I Qualitative analysis of amino acids

1. Analysis of Glycine, tyrosine, tryptophan and arginine
2. Analysis of histidine and cysteine.

COURSE WORK

1. Qualitative analysis of arginine using paper chromatographic method.

II Quantitative analysis

1. Estimation of Glycine by formal titration method
2. Estimation of protein by colorimetric method

COURSE WORK

1. Estimation of protein in milk by Kjheldal method.

REFERENCE BOOKS:

1. Laboratory manual for Analytical Biochemistry & Separation Techniques- D.R. Palanivelu, 2000; School of Biotechnology, Madurai Kamaraj University, Madurai.
2. B.Sc., Biochemistry Practical Guide (EDOC) - Dept. of Chemistry, SadakathullahAppa College, Tirunelveli.
3. Practical Clinical Biochemistry Manual- T. Mary Vijaya, M.L. Mani, K. Sunitha Kumari & K.R.T. Asha, 2003; Rishi Publications, Kalikavilai.

II SEMESTER			
SVE1	**VALUE EDUCATION – I**		**18USVE2A**
Hrs/ Week: 2	**Hrs/ Sem: 30**	**Hrs/ Unit: 6**	**Credits: 2**

Objectives:

1. To inculcate moral values in the minds of students.
2. To teach ethical practices to be adopted by students in their life.
3. To make students honest and upright in their life.

UNIT I

Islam – Meaning – Importance – A complete Religion – The religion accepted by God – Five Pillars of Islam – Kalima – Prayers – Fasting – Zakat – Haj.

Iman – Monotheism – Angels – Books – Prophets – Dooms Day – Life after death – Heaven and Hell.

UNIT II

Quran – The Book of Allah – Wahi – Revelation to Prophet Muhammad(sal) – Compilation – Preservance – Structure – Content – Purpose – Source of Islamic Law– SuraFathiha,Kafirun, Iqlas, Falakh and Nas.

UNIT III

Hadith – Siha Sitha – Buhari – Muslim – Tirmithi – Abu Dawood – Nasai – Ibn Maja – Collection of Hadith – Meaning of 40 Hadith.

UNIT IV

Life History of Prophet Muhammad (sal) – Aiamul Jahiliya – Prophet's Childhood and Marriage – Prophethood – Life at Mecca – Life at Medinah – Farewell Address – Seal of Prophethood.

UNIT V

Good character – Etiquettes – Halal and Haram – Duties towards Allah – Duties towards fellow beings – MasnoonDuas.

REFERENCE BOOKS:

1. V.A. MoahmedAshrof – Islamic Dimensions – Reflection and Review on Quranic Themes.
2. The Presidency of Islamic Researchers – Revised & Edited – The Holy Quran.
3. M. Manzoor Nomani – Islamic Faith & Practice.
4. Abdul Hasan Ali Nadvi – Muhammad Rasulullah.
5. K. Ali – A Study of Islamic History.
6. Abdul Rahuman Abdullah – Islamic Dress code for Women.
7. Dr. Munir Ahamed Mughal – Code For Believers.
8. Abdul Malik Mujahid – Gems and Jewels.

II SEMESTER			
SVE2	**VALUE EDUCATION – II**		**18USVE2B**
Hrs/ Week: 2	**Hrs/ Sem: 30**	**Hrs/ Unit: 6**	**Credits: 2**

UNIT I

Individual Morality – Objective of Moral life – Living in accordance with the code of Morality – the goodness of Morality – Morality and *Thirukural*- The need for faith.

UNIT II

Adherence to higher code of Morality – Fear of God – Good Moral Values – Duty to Parents – Teacher, respecting elders – Moral Etiquettes – Right-minded Principle – High Principles for Proper conduct.

UNIT III

Inculcating good attitudes – Open mindedness – Morale – analysing the pros and cons of good and bad – Service to others – Mind Power, tolerance, respecting others, showing love to others, patience – tranquility – Modesty, kindness and forgiveness.

UNIT IV

Quotations and moral Stories expressing Good characters of Great personalities – Life History of Great people: Mahatma Gandhi, Abraham Lincoln, Dr. A.P.J. Abdul Kalam.

UNIT V

Truth, the importance of uprightness, integrity, friendship – Health awareness on Alcohol and drug abuse – inculcating reading habit – reading good books – Hygiene – Dowry – Corruption.

TEXTBOOK:

Publication of SadakathullahAppa College.

மூன்றாம் பருவம் PART - 1 TAMIL			
TA – 3	பயன்பாட்டுத்தமிழ்		**18ULTA31**
Hrs/Week : 6	**Hrs/Sem : 90**	**Hrs/Unit : 18**	**Credits :4**

நோக்கம்

1. தமிழின் காப்பியஇலக்கிய வளத்தை மாணவர்களுக்கு உணர்த்துதல்.
2. இந்திய ஆட்சிப் பணித்தேர்வுக்கு மாணவர்களை ஆயத்தப்படுத்துதல்.
3. செய்தி வெளிப்பாட்டு உத்திகளைத் கற்றுத் தந்து மாணவர்களை ஊடகவியலாளர்களாக உருவாக்க முயலுதல்

அலகு - 1தமிழ்ச் செய்யுள்திரட்டு (துறை வெளியீடு)

1. சிலப்பதிகாரம் - காட்சிக்காதை
2. மணிமேகலை - ஆபுத்திரன் திறம் அறிவித்த காதை
3. பெரியபுராணம் - கண்ணப்பநாயனார் புராணம்
4. கம்பராமாயணம் - வாலிவதைப்படலம்
5. இரட்சண்ய யாத்திரிகம் - தீயமகன் திருந்திய கதை
6. சீறாப்புராணம் - மானுக்குப் பிணைநின்றபடலம்

அலகு - 2

"ஐ.ஏ.எஸ். தேர்வும் அணுகுமுறையும்" வெ.இறையன்பு இ.ஆ.ப, நியூ செஞ்சுரி புக் ஹவுஸ், அம்பத்தூர், சென்னை-8

அலகு - 3ஊடகப்படைப்பாக்கம்

- வானொலிக்கு உரைச்சித்திரம் தொலைக்காட்சி நிகழ்ச்சித் தயாரிப்புக்கு எழுதுதல்
- தொலைக்காட்சிச் செய்தியறிக்கை தயாரித்தல்.
- தமிழ் நாளிதழ்களுக்குச் சிறப்புக் கட்டுரைகள், வாசகர் கடிதங்கள் எழுதுதல் &இலக்கியப்படைப்பாளருடன் நேர்காணல்தொலைகாட்சி விவாதம்
- நேர்முக வருணனை
- சமூகஊடகங்களின் தாக்கம்

அலகு - 4 தமிழ் இலக்கியவரலாறு

- ஐம்பெரும் காப்பியங்கள்
- ஐஞ்சிறு காப்பியங்கள்
- சிற்றிலக்கியங்கள் (உலா, தூது, பிள்ளைத்தமிழ், பரணி)

அலகு - 5 இலக்கணம்

(தமிழ்நாடு அரசுப் பணியாளர் தேர்வாணையத்தின் பொதுத்தமிழ் இலக்கணப்பகுதி)

- பிழைத் திருத்தம், சந்திப்பிழைகள், ஒருமை&பன்மை பிழைகள், மரபுப் பிழைகள்
- வழுவுச் சொற்களை நீக்குதல், பிறமொழிச் சொற்களை நீக்குதல், வேர்சொல்லைச் தேர்வு செய்தல்.

பாடநூல்

இருந்தமிழ், சதக்கத்துல்லாஹ்அப்பா கல்லூரித் தமிழ்த்துறை வெளியீடு

பார்வை நூல்கள்

தமிழ் இலக்கியவரலாறு -க.பஞ்சாங்கம், அன்னம் அகரம் வெளியீடு, கும்பகோணம்.
இதழியல் நுணுக்கங்கள் -செண்பகா பதிப்பகம், சென்னை-17
வானொலிநிகழ்ச்சிக் கலை -சிந்துமலர் வெளியீடு, சென்னை
சீறாப்புராணம் மூலமும் பொழிப்புரையும்-ஹாஜி எம்.முகமது யூசுப், இரண்டாம் பாகம்
மக்கள்ஊடகத் தொடர்பியல் -மீடியா பப்ளிகேஷன்ஸ், மதுரை
தொலைக்காட்சி நிகழ்ச்சிக் கலை -வள்ளுவன் வெளியீட்டகம், சென்னை.

SEMESTER III			
AR-3	**Applied Grammar and Translation-III**		**18ULAR31**
Hrs/ Week: 6	**Hrs/Sem: 90**	**Hrs/ Unit: 18**	**Credits: 4**

Objectives: To enable the students to understand simple Arabic sentences and construct Arabic sentences simple by their own

Unit I:-Lessons 13 to 16 (TEXTBOOK – 1)

من الدرس الثالث عشر إلى الدرس السادس عشر

Unit II:-Lessons 17 to 19 (TEXTBOOK – 1)

من الدرس السابع عشر إلى الدرس التاسع عشر

Unit III:-Grammar Portions (TEXTBOOK – 2)

1) Imperative and Prohibition **(الأمر والنهي)**
2) Original letters which are not enhanced **(الفعل المجرد)**
3.Original letters which are enhanced **(مزيد فيه)**
4) Subjunctive mood **(الحروف الناصبة)**
5) Jussive Mood **(الحروف الجازمة)**
6) Negative particles **(ما و لا النافيتان)** ما و لا
7) Number 1 to 10,000**(العدد من الواحد إلى عشرة آلاف)**

Unit IV:-Lessons 20 to 22 (TEXTBOOK – 1)

من الدرس العشرون إلى الدرس الثاني والعشرون

Unit V:-Lessons 23 to 25 (TEXTBOOK – 1)

من الدرس الثالث والعشرون إلى الدرس الخامس والعشرون

TEXTBOOKS

1) DuroosulLughatil Arabiya Part – II Lessons 13 to 25 only by Dr.V.Abdur Rahim.
Available at: Islamic foundation Trust, 78 Perambur High Road, Perambur, Chennai- 600 012.

2) Arabic Tutor Part-I,II&III, By: Moulana Ebrahim Muhammad Karachi- DarulIshaat,

III SEMESTER			
EN 3	**Part - II - English ONE-ACT PLAYS AND WRITING SKILL**		**18ULEN31**
Hrs/ Week: 6	**Hrs/ Sem: 90**	**Hrs/ Unit: 18**	**Credits: 4**

Objectives:

1. Toexpose the conversational patterns tostudents and enable them to make use of the patterns in a given practical situation.
2. To write sentences in English grammatically.

UNIT I – ONE-ACT PLAYS

1. The Bishop's Candlesticks - Norman McKinnell
2. The Proposal - Anton Chekov
3. The Hour of Truth - Percival Wilde

UNIT II – ONE-ACT PLAYS

4. Aladdin and His Magic Lamp - Y. Sayed Mohammed
5. Tippu Sultan - Y. Sayed Mohammed
6. Evergreen Merchant of Venice - Y. Sayed Mohammed

UNIT III – WRITING SKILL

1. **Messages** (Pages 1-9 of *Written English for You* to be taught and the tasks given to be accomplished in the *Record of Writing*)
   - i) What is a message?
   - ii) When do we write messages?
   - iii) Why do we write messages?
   - iv) How do we write messages?
2. **Letters – 1** (Pages 10-20*Written English for You* to be taught and the tasks given in pages 17 and 19 should be accomplished in the *Record of Writing*)
   - i) Letters for Ordering Supply of Goods
   - ii) Letters of Complaint
   - iii) Letters of Enquiry
3. **Letters – 2** (Pages 36-42 of *Written English for You* to be taught and the tasks given in the pages 38 and 44 should be accomplished in the *Record of Writing*)
   - i) Letters to inform your plan of visit
   - ii) Letters of Request
   - iii) Letters of Asking for Advice

UNIT IV – WRITING SKILL

4. **Essays** (Pages 66-79 to be taught and only the tasks 1-3 from pages 79 and 80 should be accomplished in the *Record of Writing*)
   - i) What is an Essay?
   - ii) Types of Essays.
   - iii) The structure of an Essay.
   - iv)Introductory paragraph.
   - v)Supporting paragraph.
   - vi) What can be the length of an Essay?

vii)Why am I writing this Essay?
viii)Who am I writing for?
ix)How to begin an Essay?
x) How to organize an Essay?
xi) What to avoid in writing an Essay?

5. **Narrating** (Pages 109-116 of *Written English for You* to be taught only the tasks 1 and 2 from pages 115 to 116 to be accomplished in the *Record of Writing*)
    i) Describing events in a chronological order.
    ii) Narrating events from different points of view
    iii) Narrating events from different view point in time

UNIT V – WRITING SKILL

6. **Reporting** (Pages 127-136 be taught. The tasks given in pages 129- 134 and 136-137 must be accomplished in the *Record of Writing*)
    i) News Reports
    ii) Reporting events or Developments.
    iii)Reporting Interviews and Press Conferences
    iv)Reports of Meetings.
7. **Summarizing** (Pages 164-172 of *Written English for You*be taught and the tasks 1-3 in pages 172-178 to be accomplished in the *Record of Writing*)
    i) What is a Summary?
    ii) How to write a Summary?
    iii) How long should a Summary be?
    iv)Should the Summary be in a Paragraph?
    v)Analysis of the process of Summarizing.

NOTE: Questions for Units III, IV and V should be framed from the tasks given in the prescribed textbook ***Written English for You.***

TEXTBOOKS

1. Compiled by a Board of Editors. *Plays for Pleasure*. Chennai: Paavai Publications, 2009.
2. Sayed Mohammed .Y, ed. *Three One-Act Plays*. Tirunelveli: Muhammed Taahaa Publications, 2011.
3. Radhakrishna Pillai.G, ed. W*ritten English for you*. Chennai: EmeraldPublishers, 1990 (rpt. 2008).

III SEMESTER			
DSC5	**PHYSICAL CHEMISTRY - I**		**18UCCH31**
Hrs / Week: 4	**Hrs / Sem: 60**	**Hrs / Unit: 12**	**Credit: 4**

UNIT I - Gaseous State

Maxwell's law of distribution of velocities (derivation) - graphical representation and its significance.Effect of temperature on distribution of molecular velocities - types of molecular velocities. Collision diameter - collision number - collision frequency - mean free path - Problems.

Degrees of freedom of a gaseous molecule - Principle of equipartition of energy - Calculation of specific heat ratio for monoatomic, diatomic and polyatomic molecules.

UNIT II - Solid State & Liquid crystals

Solids - types of solids - crystalline and amorphous solids. Types of crystalline solids - molecular crystal, covalent crystal, ionic crystal and metallic crystals. Types of packing - HCP,CCP - Types of voids.

Structure of diamond, graphite, NaCl, CsCl, Sphalerite, Wurtzite and Rutile.

Crystal defects - Point defect - Schottky and Frenkel defect -Metal excess and metal deficiency defects - Crystal growth from gel method.

Liquid crystals - Smectic, Nematic and Cholesteric types- Applications

UNIT III - Colloids and Surface Chemistry

Colloids - coagulation of colloids - Hardy Schulze law - protective colloids - gold number - Hoffmeister series - Gels - Classification, preparation and properties. Emulsion - types - emulsifiers - surfactants. Donan- membrane equilibrium

Adsorption - Factors influencing adsorption - Physisorption and Chemisorption - Freundlich adsorption isotherm and Langmuir adsorption isotherms - Derivation - BET isotherm (derivation not required) - Applications of adsorption.

UNIT IV –Nuclear Chemistry - I

Nuclear size - Nuclear forces - Mass defect, binding energy and Packing fraction - Mass energy relation - Nuclear stability - n/p ratio - odd - even rule - Magic numbers - Nuclear models - liquid drop and nuclear shell model – Problems.

Types of radioactive decay - Radioactive series - Soddy's group displacement law - rate of decay - half life and average life period - Geiger Nuttal rule - nuclear isomerism.

UNIT V - Nuclear Chemistry - II

Nuclear reactions (elastic, inelastic and spallation) - Artificial transmutation and induced radio activity.

Nuclear fission - energy released during fission - Uncontrolled fission - Principle of Atom bomb - Controlled fission - Atomic reactors - Thermal reactors and Fast Breeder reactors.

Nuclear fusion - Principle of Hydrogen bomb - Stellar energy - Differences between nuclear fission and nuclear fusion.

Applications of radioactive isotopes - Radio carbon dating - Radioactive hazards.

REFERENCE BOOKS:

1. Principles of Physical chemistry - B. R. Puri, L. R. Sharma, Madan S. Pathania, 2004; Vishal publishing co. - New Delhi
2. A TEXTBOOK of Physical Chemistry - Samuel Glasstone,1976; Macmillan (India) Ltd., New Delhi
3. Solid state chemistry and its applications - Antony R. West, 1989; John Wiley & Sons, New Delhi. .
4. Nuclear chemistry - R. Gopalan, 2000; Vikas Publishing House, New Delhi.
5. Essentials of Physical Chemistry - ArunBahl, B. S. Bahl, G. D. Tuli, 2008, S. Chand & Company Ltd, New Delhi.
6. Essentials of Nuclear Chemistry - H. J. Arniker, 1995, 4th Edition, New Age International Publishers, New Delhi.

III SEMESTER			
DSE 1A	**POLYMER CHEMISTRY**		**18UECH3A**
Hrs / Week: 4	**Hrs / Sem: 60**	**Hrs / Unit: 12**	**Credit: 4**

UNIT I - Polymer and its types

Polymer- Natural and synthetic polymers - General characteristics of a polymer - Distinction among plastics, elastomers and fibres.Homo and heteropolymers. Copolymer – tacticity - isotactic, atactic and syndiotactic polymers - Functionality - Linear, branched and cross linked polymers - Plastics, Thermosetting and thermoplastics - Types of polymerization - addition, condensation and copolymerization (Mechanism not required).

UNIT II - Methods of polymerization and synthesis of some important polymer

Methods of polymerization - bulk, suspension, emulsion and solution polymerization

Synthesis, properties and applications of Phenol - formaldehyde resin, Melamine - formaldehyde resin, Polyurethanes, Polycarbonates, Natural rubber, Vulcanization of rubber, synthetic rubber - styrene rubber, nitrile rubber and neoprene rubber

UNIT III - Synthetic polymers

Synthesis, properties and application of - Polyethylene - HDPE, LDPE, LLDPE - Polypropylene - Polyvinyl chloride - grades of PVC - Teflon, Polymethylmethacrylate (plexiglass) - Polyamide – Nylon 6, Nylon 66,Cellulose acetate and Cellulose nitrate.

UNIT IV – Physical states and biomedical applications of polymers

Synthesis of intermediates - Terephthalic acid, Caprolactum and Hexamethylenediamine - Molecular mass - number average, weight average, viscosity average molecular mass - Determination of molecular mass by viscosity and light scattering method - practical significance of molecular mass distribution - size of polymers. Kinetics of free radical polymerization - Carother's equation - Bio - medical applications of polymers.

UNIT V – Properties and processing of polymers

Glassy state - glass transition temperature, factors affecting glassy state - crystallinity in polymers, viscosity, solubility, optical, electrical, thermal and mechanical properties of polymers. Degradation of polymers by thermal, oxidative, mechanical and chemical methods - Polymer processing - Compression moulding, injection moulding, transfer moulding.

REFERENCE BOOKS:

1. Polymer science - V.R Gowarikar, N.V Viswanathan and J. Sreedhar 2000; New Age International (P) Ltd., New Delhi.
2. TEXTBOOK of polymer science - F.W. Billmeyer.1984; A Wiley–Interscience Publication, John Wiley & Sons New York.
3. TEXTBOOK of polymer science - P.L. Nayak& S. Lenka, 2000; Kalyani publishers, New Delhi.

III SEMESTER			
DSE 1B	**MATERIAL SCIENCE**		**18UECH3B**
Hrs / Week: 4	**Hrs / Sem: 60**	**Hrs / Unit:12**	**Credit: 4**

UNIT I - Ionic Conductivity and Solid electrolytes

Types of ionic crystals-Alkali halides-Silver chloride-Alkali earth fluorides- Types of ionic conductors - halide ion conductors - oxide ion conductors - Solid electrolytes - Applications of solid electrolytes.

Electrochemical cell - principle, Batteries, Sensors and Fuel cells. Crystal defects in solids- Schottky and Frenkel defects - Electronic properties and band theory: metals, semiconductors. Inorganic solids, colour, Magnetic properties, Optical properties.

UNIT II - Ferrous and Non-Ferrous Alloy

Ferrous alloys, Carbon and ferrous alloy, steels, various types of carbon steels, their properties and uses; stainless steels.Non-ferrous alloys, properties of ferrous and non-ferrous alloys and their applications.

UNIT III - Glass, Ceramics and Composites

Glassy state, glass formers and glass modifiers, applications - Ceramic structures, mechanical properties, clay products, Refractories, characterizations, properties and applications. Microscopic composites, dispersion –strengthened and particle - reinforced, fiber-reinforced composites, macroscopic composites, Nano-crystalline phase, preparation procedures, special properties, applications.

UNIT IV - Organic Devices.

Types of polymerization- Methods of polymerization. Chemical analysis of polymers- spectroscopic methods- X-ray diffraction analysis processing techniques of polymers, Medical applications of polymers- contact lens, dental polymers, artificial heart, kidney, skin and blood cell – water absorbing polymers.

UNIT V - Synthetic Organic Metals.

Conducting organics, organics superconductors, magnetism in organic materials. Electrically conducting organic solids - organic metals - Conjugated polymers- doped polyacetylene, polyaniline, and polypyrrole - preparation and applications. Blends and composites of polymer materials - Organic charge-transfer complexes and new superconductors. Fullerenes- doped fullerenes as superconductors. Nanocarbon and its applications.

REFERENCE BOOKS:

1. Solid State Chemistry and its Applications; Anthony R. West, 1989, John Wiley &Sons.
2. Material Science; R. S. Khurmi and R. S. Sedha, 2000, S. Chand & Company Ltd.
3. Materials Science and Engineering; V. Raghavan, 2001; Prentice- Hall of India Pvt. Ltd.
4. Materials Science – Dr. Arumugam – Anuradha Publications, Kumbakonam.

PART III – ALLIED II			
Allied Physics offered by Physics Department to B.Sc. Mathematics and B.Sc. Chemistry Students			
III SEMESTER			
	ALLIED PHYSICS – I		18UAPH31
Hrs/Week: 4	Hrs/Sem: 4x15= 60	Hrs./ UNIT :12	Credit: 3

Objectives:

- To acquire an in-depth knowledge of Elasticity.
- To understand the basic phenomena of light
- To inculcate the knowledge about heat transfer phenomena.

UNIT I Elasticity

Elasticmodulii – Poisson's ratio – relation between elastic constants – Expression for bending moment – cantilever – expression for depression – experiment to find young's modulus (uniform bending) – expression for elevation – experiment to find young's modulus using microscope (non uniform bending) – expression for depression – experiment to find Young's modulus using scale and telescope.

UNIT II Interference and Diffraction

Young's experiment – Condition for interference – Additional phase difference due to dissimilar reflections – Colours of thin film – Air wedge – Thickness of wire – Fresnel and Fraunhofer diffraction – Plane transmission grating – Theory and experiment to find wave length by normal incidence method. Distinction between interference and diffraction bands.

UNIT III Polarisation

Double refraction – Nicol prism – Brewster's law – Production and analysis of plane, circularly and elliptically polarized light, half wave and quarter wave plate – Optical activity – specific rotation (definition)

UNIT IV Transport Phenomena

Mean free path – expression for mean free path (Zeroth order approximation) Transport phenomena – Viscosity, thermal conductivity, diffusion

UNIT V Transfer of Heat

Conduction – Coefficient of thermal conductivity – definition – Thermal conductivity of a bad conductor – Lee's Disc experiment –Convection – Newton's law of cooling – determination of specific heat capacity of liquid – Radiation – Stefan's law – Planck law.

Books for Study and References:

1. Properties of matter – Brijlal&Subrahmanyam – S.Chand& Co. – New Delhi.
2. College Physics – Volume 1 – A.B.Gupta – Books and Allied (P) Ltd. – Kolkatta – 700010.
3. Heat and Thermodynamics, Brijlal&SubramaniyamS.Chand&Co. – New Delhi.
4. A TEXTBOOK of Optics, Brijlal,Subrahmanyam&M.N.Avathanu – S.Chand& Co. – New Delhi.

III SEMESTER		
DSCP 3	**INORGANIC QUALITATIVE ANALYSIS OF SIMPLE SALT & INORGANIC PREPARATION**	**18UCCH3P1**
Hrs / Week: 2	**Hrs / Sem: 30**	**Credit: 1**

A. INORGANIC QUALITATIVE ANALYSIS

Systematic qualitative analysis of a simple salt containing an anion and a cation.

Anions:

1. Carbonate
2. Sulphate
3. Nitrate
4. Chloride
5. Bromide
6. Oxalate
7. Borate
8. Fluoride
9. Phosphate

Cations

1. Lead
2. Copper
3. Cadmium
4. Nickel
5. Zinc
6. Manganese
7. Barium
8. Strontium
9. Calcium
10. Magnesium
11. Ammonium

The students are expected to analyze a minimum of 8 simple salts in their record note.

INORGANIC PREPARATION

1. Preparation of potash alum
2. Preparation of chrome alum
3. Preparation of Prussian blue
4. Preparation of sodium ferrioxalate
5. Preparation of tetrammine copper (II) sulphate
6. Preparation of tristhiourea copper (II) chloridedihydrate
7. Preparation of potassium trisoxalatoferrate(III) [Course work]
8. Preparation of hexathiourea lead (II) nitrate [Course work]

The students are expected to prepare a minimum of 6 in their record note.

REFERENCE BOOKS:

1. V.V. Ramanujam, Inorganic Semi-micro Qualitative Analysis, 3rd Edition, The National Publishing Company, Chennai, 1974.
2. Vogel's TEXTBOOK of Quantitative Inorganic Analysis - A. I. Vogel, (Longman), Pearson education, India.
3. Advanced Practical Chemistry - R. Mukhopadhyay and P. Chatterjee, 2007; Arunabha Sen, Books &Alied (P) Ltd., Kolkata.
4. Advanced Practical Chemistry - N. K. Vishnoi, 2005; Vikas Publishing House, New Delhi.
5. Advanced Course in Practical Chemistry - Ghoshal, Mahapatra &Nad, 2000; New Central Book Agency (P) Ltd., Kolkata.

III SEMESTER			
AII-P1	**Allied Physics Practical-I**		**18UAPH3P1**
Hrs/Week: 2	**Hrs/Sem: 2x15=30**		**Credit: 1**

1. Young's modulus – Uniform bending (Pin and Microscope)
2. Young's modulus – Non Uniform bending (scale and Telescope)
3. Verification of Kirchoff's law.
4. Verification of Newton's law of cooling
5. Spectrometer Grating – Oblique incidence
6. LCR series circuit
7. Air wedge – Thickness of wire
8. Calibration of Voltmeter using potentiometer
9. Characteristics of Zener diode
10. Basic logic gates OR, NOT & AND

Books for References:

1. Practical Physics - Ouseph, Srinivasan &Vijayendran,
2. Practical Physics – P. R. Sasi Kumar, PHI.
3. Advanced Practical Physics - S. P. Singh, PragathiPrakasam.
4. Practical Physics – St. Joseph College, Trichy.

III SEMESTER Part IV - Non Major Elective			
NME-I	**WATER MANAGEMENT**		**18UNCH31**
Hrs / Week: 2	**Hrs / Sem: 30**	**Hrs / Unit: 6**	**Credit:2**

UNIT I: WATER POLLUTION

Definition - sources of water pollution - types of water pollutants: sewage and domestic wastes, industrial effluents, agricultural discharges, detergents, disease causing agents and radioactive materials. Eutrophication and its effects.

UNIT II: WATER QUALITY PARAMETERS

Physical, Chemical and biological water quality parameters - water quality standards for drinking water - BIS, ICMR and WHO. Determination of pH, Total hardness, TDS, DO, BOD and COD.

UNIT III: WATER PURIFICATION

Purification of water: Sedimentation, Filtration, disinfection, water softening permutit process, ion - exchange process, reverse osmosis.

UNIT IV: WASTE WATER TREATMENT

Elementary ideas of waste water treatment: pre - treatment - primary treatment - secondary treatment, Trickling and activated sludge process - tertiary treatment: evaporation, adsorption - clinical precipitation

UNIT V: RESTORATION AND MANAGEMENT

Importance of lakes and rivers - stresses on the Indian rivers and their effects - A restoration case study: Ganga Action plan: objectives implementation and drawbacks. Rain water harvesting - water recycling - The water prevention and control Pollution Act 1974.

REFERENCE BOOKS:

1. Environmental Chemistry, A.K. De, Wiley Eastern Ltd. New Delhi
2. Environmental Chemistry, B.K. Sharma, Geol Publishing House, Meerut.
3. Chemical and Biological methods for water pollution Studies, R.K. Trivedy and P.K. Geol Environmental Publications, Karad, India.
4. BIS 1991, Specification for drinking water, Bureau of Indian Standards, New Delhi
5. WHO 1992, International standards for Drinking water, World Health Organisation, Geeneva.
6. Environmental Science and Biotechnology - Theory and Techniques - A.G. Murugesan, C. Rajakumari, MJP Publishers, 2005.

நான்காம் பருவம்			
PART – I - TAMIL			
TA - 4	சங்கத்தமிழ்		18ULTA41
Hrs/Week : 6	Hrs/Sem : 90	Hrs/Unit : 18	Credits : 4

நோக்கம்

1. சங்கஇலக்கியம் குறித்த புரிதலை மாணவர்களுக்கு ஏற்படுத்துதல்.
2. இணையத்தில் தமிழின் இடத்தினைஉணர்த்துதல்.
3. மாணவர்களை இணையத்தைப்பயன்படுத்த அறிவுறுத்துதல்.

அலகு - 1

தமிழ்ச் செய்யுள் (துறை வெளியீடு)

நற்றிணை (பாடல் எண்கள் 68-95), குறுந்தொகை (பாடல் எண்கள் 2, 23), ஐங்குநூறு (பாடல் எண்கள் 23, 49), பதிற்றுப்பத்து (பாடல் எண் 69), பரிபாடல் (செவ்வேள்-திருப்பரங்குன்றத்தின் அமைப்பும் சிறப்பும்-பாடல் எண்கள் 1 முதல் 20 வரை), கலித்தொகை (பாடல் எண் 10), அகநானூறு (பாடல் எண் 44), புறநானூறு (பாடல் எண் 187) மற்றும் பத்துப்பாட்டில் குறிஞ்சிப்பாட்டு முதல் 98 வரிகள்.

அலகு-2

நம்பிக்கைத் தமிழ் -கல்லூரித் தமிழ்த்துறை வெளியீடு,

அலகு - 3

இணையமும் தமிழும்

- தமிழ் இலக்கியப் பதிவுகளும் இணையமும்
- இணையத்தில் படைப்பை வெளியிடும் முறைகள்
- தமிழ் விக்கிபீடியா -அறிமுகம்
- வலைப்பூக்களை உருவாக்க மாணவர்களுக்குப் பயிற்சிதரல்
- தமிழ் மின் நூலகம்
- மின் நூல்களும் வாசகத்தன்மையும்
- புகழ்பெற்ற தமிழ் இலக்கியத் தளங்கள் குறித்தஅறிமுகம்.

அலகு - 4

இலக்கியவரலாறு

- சங்கஇலக்கியம் ஓர் அறிமுகம்
- எட்டுத்தொகை, பத்துப்பாட்டு
- சங்கஇலக்கியத் திணைக் கோட்பாடும் சங்ககாலமக்கள் வாழ்வியலும்

அலகு - 5

இலக்கணம்

- தமிழர் வாழ்வில் அகமும் புறமும்
- ஐவகைநிலங்களின் முதல், கரு, உரிப் பொருட்கள்
- அறத்தொடு நிற்றல்
- களவு, கற்பு விளக்கம்
- புறத்திணைகள்

பார்வை நூல்கள்

தமிழ்க் கணினிஇணையப்பயன்பாடுகள் - முனைவர் துரை .மணிகண்டன்
த.வானதி
கமலினிபதிப்பகம்
கச்சமங்கலம் அஞ்சல்,
தோகூர் வழி,
தஞ்சாவூர் மாவட்டம்

இணையத் தமிழ் -தமிழ்த்துறை வெளியீடு
சதக்கத்துல்லாஹ்அப்பா கல்லூரி
திருநெல்வேலி.

வழிகாட்டு இணையதளங்கள்

1. www.selliyal.com
2. www.tamilvu.org
3. www.tamilcanadian.com
4. www.bbc.com
5. www.tamilinayam.com

	SEMESTER - IV		
AR-4	**CLASSICAL PROSE**		**18ULAR41**
Hrs/ Week: 6	**Hrs/ Sem: 90**	**Hrs/ Unit: 18**	**Credits:4**

Objectives: To impart the moral values in the students and build their personality to make them better citizens to serve the society.

Unit I:- Verses from 1 to 12 from (Sura – al – Hujraat)(TEXTBOOK – 1)

من الآية "يا أيها الذين آمنوا لا تقدموا" إلى الآية"يا أيها الذين آمنوا اجتنبوا "

Unit II:- Verses from 10 to 18 from (Sura – al – Hujraat)& verses from Surah Lqman from (12 to 19) (TEXTBOOK – 1)

من الآية "يا أيها الناس إنا خلقناكم" إلى الآية "إن الله يعلم غيب السموات"

من الآية "ولقد آتينا لقمان الحكمة " إلى الآية "واقصد في مشيك"

Unit III:- Collection and compilation of Quran and Hadeeth, History of Imam Abu Hanifa, Malik, Asshafi,Ahmad, Bukhari, Muslim, Abu Dawood, At-Tirmidi, An-Nasaee and Ibn-Majah (TEXTBOOK – 1)

Unit IV:-Hadeeth 1 to 10 (TEXTBOOK – 2)

من الحديث " لا تأكلوا بالشمال" - إلى الحديث " خيركم من تعلم القرآن"

Unit V:-Hadeeth 11 to 20 (TEXTBOOK – 2)

من الحديث " لا تمنعوا نسائكم " - إلى الحديث " حق المسلم على المسلم خمس"

TEXTBOOK

1. TafseerSuratulHujuraathandfromSuraahLuqman (verses from 12-19) A study material prepared by Dept. of Arabic, SadakathullahAppaCollege,Rahmath Nagar, Tirunelveli-11

2. Hadeeth: AhadeethSahlah Available at: Islamic foundation Trust, 78, Perambur High Road, Perambur, Chennai- 600 012.

IV SEMESTER			
EN4	**Part - II - English** **A PRACTICAL COURSE IN SPOKEN ENGLISH**		**18ULEN41**
Hrs/ Week: 6	**Hrs/ Sem: 90**	**Hrs/ Unit: 18**	**Credits: 4**

Objectives:

1. To express one's needs orally in a fluent, simple and direct style.
2. To pronounce words intelligibly
3. To use the right intonation pattern in speech.

UNIT I

Interactive Expressions and Pronunciation Practice: Consonants (Chapters 1 – 3 of *A Course in Spoken English*)

UNIT II

Introducing oneself / others, patterns for greeting, requesting, expressing and respondingto thanks and etc.,& Pronunciation Practice: Vowels (Chapters 4 – 8 of *A Course in Spoken English*)

UNIT III

Developing descriptive competency, narrative competency, arguing competency,compering competency and pronunciation practice: Diphthongs(Chapters 9 – 13 of *A Course in Spoken English*)

UNIT IV

Practising continuous speech, group discussion and pronunciation practice: Word Accent and Intonation
(Chapters 14 – 19 of *A Course in Spoken English*)

UNIT V LISTENING PRACTICE

Students will listen to audio and video materials for 10 – 12 hours.

Textbook, Workbook, Record Note:

1. Nihamathullah. A. et al. *A Course in Spoken English*. Tirunelveli: MSU, 2005. (rpt.2010).
2. Board of Editors, Department of English, SadakathullahAppa College, *A Workbook forA Course in Spoken English*,2011.
3. Spoken English Practice Record.

Evaluation Scheme:

I Internal Oral Test : 15 Marks
II Internal Oral Test : 15 Marks
III Internal Oral Test : 15 Marks

} The best two of the three CIA test marks will be added up

Distribution of Marks

The best two of the three CIA test marks	:	30 Marks
Loud Reading	:	5 Marks
Listening Test	:	5 Marks
Internal Marks	:	40 Marks
External Oral Test	:	50 Marks
Record Note	:	05 Marks
Workbook	:	05 Marks
External Marks		60 Marks

IV SEMESTER			
DSC 6	**INORGANIC CHEMISTRY - II**		**18UCCH41**
Hrs / Week: 4	**Hrs / Sem: 60**	**Hrs / Unit: 12**	**Credit: 4**

UNIT I - Principles and Processes of Metallurgy

Occurrence of elements in nature, minerals & ores, Types of ores - Various steps of metallurgy - concentration of ores (Froth floatation process, Magnetic separation process), calcination, roasting.Reduction to free metals - Carbon (smelting) heating in air, carbon monoxide, hydrogen - aluminothermic process - Kroll's process.Refining - Mond's process, van Arkel - de - Boer process, electro refining, Zone refining.Metallurgy of Titanium & Nickel and their important uses.

UNIT II - d block elements - I

General characteristics of d-block elements - Comparative study of Ti, Zr, Hf.Preparation and uses of TiO_2 and $TiCl_4$. Comparative study of V,Nb,Ta. Metallurgy and uses of V- preparation and uses of V_2O_5 and NH_4VO_3 – polyvalency of V – comparative study of Cr,Mo,Wpolyvalency of Cr – preparation & uses of ammonium molybdate,and Tungsten Bronzes.

Comparative study of Fe, Co and Ni – Metallurgy and uses of Co – Preparation and uses of sodium cobaltinitrite.

UNIT III - d block elements - II

Comparitive study of Cu, Ag and Au - Comparative study of Zn, Cd and Hg -Polycations- Toxicity of cadmium and mercury.

Metallurgy and uses of platinum – preparation and uses of platinized asbestos, colloidal platinum, spongy platinum, platinum black and potassium chloroplatinate.

UNIT IV - f - Block elements

Lanthanides - occurrence - general characteristics of Lanthanides - Lanthanide contraction and its consequences.

Actinides - occurrence - general characteristics of actinides. Extraction and uses of Uranium and Thorium.Preparation and uses of UF_6 and Zinc uranyl acetate. Applications of lanthanides.

UNIT V: Inorganic Polymers

Inorganic Polymers -Classification - general methods of preparation and general properties.

Polymers containing Boron - Preparation, reactions, uses and structure of borazine & Boron nitride. Polymers containing Silicon - Preparation of various types of Silicones- structure and uses of high thermal silicones, silicone resins, Silicones rubber and greases.

Polymers containing Phosphorous - Chain and network polymers - preparation structures and uses of polyphosphonitrilic chloride, poly *ortho* phospates, poly meta phosphates, Inorganic rubber.

REFERENCE BOOKS:

1. Advanced Inorganic Chemistry Volume I - Sathyaprakash and R. D. Madan, 2005S. Chand and Company, New Delhi
2. General and Inorganic Chemistry Volume I,R. Sarkar - 2005; New central Book Agency, Kolkotta.
3. College Chemistry - J.L. Rosenberg and L.M. Epstein - 2004, Schaums Outlines, Tata McGraw Hill Publishing Company, New Delhi
4. Theoretical Principles of Inorganic Chemistry, G. S. Manku, 2004: Tata Mcgraw Hill Publishing Company, New Delhi
5. TEXTBOOK of Inorganic Chemistry P.L. Soni& M. Katyl - 2004, Sultan Chand & Sons, New Delhi
6. Industrial Chemistry - B. K. Sharma, Goel Publishing House, New Delhi
7. Fundamentals Concepts of Inorganic Chemistry - E. S. Gilreath Tata McGraw Hill Publishing Company, Meerut.
8. Atomic structure and chemical bonding – Manee Chanda, Tata McGraw Hill Publishing Company, New Delhi

IV SEMESTER			
DSE 2A	**CHROMATOGRAPHY**		**18UECH4A**
Hrs / Week: 4	**Hrs / Sem: 60**	**Hrs / Unit: 12**	**Credit: 4**

UNIT I - Basic Concepts of chromatography:

Introduction - Classification based on principle - Adsorption Chromatography methods - Column Chromatography - Principles, experimental procedures, stationary and mobile phases, Choice of Solvent Systems based on polarity, Separation techniques. Applications

UNIT II - Paper Chromatography

Principle, $R_f$values, Factors affecting R_f values, Experimental procedures, Choice of paper and solvent systems, developments of chromatogram. Detection of the spots. Ascending, Descending and Radial Paper Chromatography, Two Dimensional Chromatography – Applications – separation of amino acids from a mixture.

UNIT III - Thin - Layer Chromatography

Principle - Experimental Procedures.Choice of adsorbents and Solvents.Preparation of plates. Development of the Chromatogram.Detection of the spots.Advantages of thin Layer Chromatography over paper chromatography. Applications- Characterizing and isolation of organic compounds- Alcohols, Alkaloids, Amines, Amino acids and antibiotics.

UNIT IV - Ion Exchange Chromatography

Principle, ion exchange resins and their types - cation exchange resins, anion exchange resins, ion exchange equilibria, properties of ion exchange resins, ion exchange capacity, techniques - applications of ion exchangers- removal of interfering radicals-separation of similar ions from one another, lanthanides, sugars and amino acids.

UNIT V - High Performance Liquid Chromatography

Introduction, Instrumentation, Stationary and Mobile Phases.Mobile Phase - Composition.Column - Preparation, Cleaning - regeneration and Storage Conditions.Retention time - Types of HPLC.

REFERENCE BOOKS:

1. Fundamentals of Analytical Chemistry - D.A. Skoog, D.M. West, F.J. Holler and S.R. Crouch 2004; Thompson Asia Private Ltd., Bangalore.
2. Instrumental Methods of Analysis - B.K. Sharma, 2003; Goel publishing House, Meerut, India.
3. Contemporary Chemical Analysis - Judith F. Rubinson, Prentice Hall (India).
4. An introduction to Chromatography - H. Kaur, 2001: Pragati Prakashan, Meerut, India.
5. Laboratory Manual for Analytical Biochemistry &Separation Techniques - P. Palanivelu, 2000: School of Biochemistry, MK University, Madurai
6. Instrumental Methods of Chemical Analysis, Gurdeep R. Chatwal and Sham Anand, 1997, Himalaya Publishing House, Mumbai.

IV SEMESTER			
DSE 2B	**DAIRY CHEMISTRY**		**18UECH4B**
Hrs / Week: 4	**Hrs / Sem: 60**	**Hrs / Unit: 12**	**Credit: 4**

UNIT I: **PROPERTIES OF MILK**

Milk – definition - composition - physico chemical properties – colour, odour, acidity, specific gravity, conductivity of milk – Indian standards of milk.Factors affecting composition of milk - food and nutritive value.Physico-chemical properties of milk constituents – water, fat, proteins, lactose and mineral matter.Action of milk on metals. Flavour defects in milk - their causes and prevention - uses of milk. Estimation of fat, acidity and total solids in milk.

Adulterants in milk – definition, common adulterants and their detection. Preservatives in milk – definition, common preservatives and their detection.Neutralizers in milk – definition, the different types of neutralizers and their detection.

UNIT II: **MICROBIOLOGY OF MILK**

Introduction, growth of micro-organisms, destruction of micro-organisms – heat treatment, use of ionizing radiation, electricity, high frequency sound waves and application of pressure. Pasteurization – definition, objectives and requirements of pasteurization. Methods of pasteurization – in-the-bottle pasteurization, batch / holding pasteurization or Low-Temperature – Long Time pasteurization (LTLT), High Temperature – Short Time pasteurization (HTST), Ultra-High Temperature pasteurization (UHT), Uperization (Ultra-pasteurization), vacuum pasteurization (vacreation) and stassanization.

Dairy detergents – definition – desirable properties, different types, cleaning and sanitizing procedure, cleaning-in-place (CIP).Sterilizers – definition – desirable properties – cleaning and sterilization of dairy utensils – Chloramine – T and hypo chlorite solution.

UNIT III: SPECIAL MILKS

Sterilized milk – definition, requirements, advantages and disadvantages and method of manufacture. Homogenized milk – definition, merits and demerits method of manufacture.

Flavoured milks – definition, purpose, types of flavoured milks, method of manufacture. Chocolate flavoured milk and Fruit flavoured milk. Vitaminized milk – definition, purpose Standardized milk – definition, merits, method of manufacture. Toned milk (single and double toned milk) – manufacture. Humanized Milk.

Dried milk: Definition**,** composition, objectives of productions **-** principle involving in manufacture, food and nutritive value, role of milk constituents, keeping quality.

Condensed Milk: Definition**,** composition, objectives of productions - principle involving in manufacture of condensed milk (flow chart and explanation) - uses of condensed and evaporated milk. Types of condensed milk – plane condensed milk, super heated condensed milk, frozen condensed milk.

UNIT: IV: **CREAM, BUTTER, GHEE, ICE CREAM AND CHEESE**

Creams: Definition – composition - gravitational and centrifugal methods of separation of cream - estimation of fat in cream.

Butter: Definition - percentage composition - manufacture of butter, estimation of fat in butter - determination of acidity and moisture content - desibutter.

Ghee: Major constituents of ghee - common adulterants added to ghee - detection of the adulterants. Rancidity of ghee – definition, different types – hydrolytic, oxidative and ketonic rancidity - prevention of rancidity - antioxidants

Ice cream: Introduction – definition – classification – composition – food and nutritive value – defects in ice cream, their causes and prevention.

Cheese: Introduction – definition – classification – composition – food and nutritive value – cottaged cheese - processed cheese – defects in cheese - their causes and prevention.

UNIT V: PROTEINS, CARBOHYDRATES, VITAMINS IN MILK AND DAIRY SWEETS.

Milk Proteins: Physical properties of milk proteins - electrical properties - hydration of proteins, solubility - effect of heat on milk protein, milk enzyme and functions.

Milk carbohydrate: Lactose - structure of lactose (both α- and β–forms), reactions of lactose – hydrolysis, oxidation and reduction. Estimation of lactose in milk – picric acid method and chloramine – T method.

Milk vitamins: Water soluble vitamins and fat-soluble vitamins in milk - form of occurrence in milk - importance of the vitamins with respect to physiological activity - effect of heat treatments and exposure to light radiation.

Dairy Sweet: Preparation of peda, gulabjamun, rossogolla and kheer paneer.

Kheer – Khoa/ Mawa – Khurchan – Rabri-Kulfi/Malai –Ka- baraf- Dahi – Panir- Chhana – Makkhan – Lassi - Ghee Residue.

REFERENCE BOOKS:

1. Webb Johnson and Alfond, Fundamentals of Dairy Chemistry C.B.S. Publishers and Distributers Delhi.
2. Rangappa, K.S. and Achaya, K.T. (1974). Indian Dairy products, Asia Publishing House, Bombay
3. Webb, B.H. and Whittier, E.O. (1970). By-products from Milks, the A.V.I. Publ. Co. Inc., Westport, Connecticut.
4. Srinivasan, M. R. and Anantakrishnan, C.P.: (1957). Milk Products of India, ICAR Animal Husbandry Series No. 4, New Delhi.
5. Murray, R.K., Granner, D.K., Mayes, P.A. and Rodwell (1990). V.W. Harper's Biochemisry, (21stEdn). McGraw-Hill.
6. Sukumar De. (1991). Outlines of Dairy Technology, (1st Edn.), Oxford University Press.

PART III – ALLIED II			
Allied Physics offerred by Physics Department to B.Sc. Mathematics and B.Sc. Chemistry Students			
IV SEMESTER			
	ALLIED PHYSICS – II		18UAPH41
Hrs/Week: 4	Hrs/Sem: 4x15= 60	Hrs./ UNIT :12	Credit:3

Objectives:

- To study the wave nature of matter and to understand the nucleus and its properties.
- To give an insight to the electric and magnetic phenomena.
- To study the characteristics and to working principles of diodes and transistors.
- To understand the logic gates and boolean algebra
- To inculcate the knowledge about heat transfer phenomena

UNIT I Relativity and Wave Mechanics

Frame of reference – Galilean transformation – Postulates – Lorentz transformation – de Broglie's theory of matter waves – Expression for de Broglie wavelength – Davison and Germer experiment

UNIT II Nuclear Physics

Nuclear structure – Properties of nucleus – Packing fraction – Binding energy – BE/A curve – Nuclear forces – Nuclear stability – Liquid drop model.

UNIT III Electricity & Electromagnetism

Charge – Current – Potential difference – Resistance & Resistivity – Ohm's law – Kirchoff's law – Potentiometer – Principles – Calibration of Voltmeter – Capacitor – LCR series circuit –LCR parallel circuit- Self induction – self inductance of toroidal solenoid – mutual inductance between coils.

UNIT IV Basic Electronics

Semiconductor diode – Diode Characteristics – Zener diode characteristics – Regulation with Zener diode – Bridge rectifier – Biasing of transistor – RC Coupled Amplifier.

UNIT V Digital Electronics

Basic logic gates – NOR, NAND gates – EX – OR gate – Boolean equations and logic circuit from table – NOR and NAND gates as universal building blocks – Binary adder – Half adder – Full adder

Books for Study and References:

1. Modern Physics – R. Murugesan and KiruthigaSivaprasath – (15th edition) – S. Chand& Co., New Delhi.
2. Electricity & Magnetism – R. Murugesan. 8th edition – S. Chand& Co., New Delhi.
3. Introduction to Integrated Electronics, Digital and Analog – V. Vijayendran – S. Viswanathan Pvt. Ltd., Chennai.

IV SEMESTER		
DSCP4	**INORGANIC QUALITATIVE ANALYSIS OF MIXTURE**	**18UCCH4P1**
Hrs / Week: 2	**Hrs / Sem: 30**	**Credit: 1**

Systematic Qualitative analysis of a mixture containing two anions and two cations. One of the anions should be an interfering radical which should be eliminated. The two cations should be of different groups.

The combination of

Mixture containing sulphates along with Lead and group V cations,
Mixture which need fusion,
Mixture containing oxalate and carbonate and
Mixture containing one oxidizing and one reducing groups should be avoided.

The micro techniques method of analysis is recommended. However, the semi micro technique is also permitted

Anions:

1.Carbonate
2. Sulphate
3. Nitrate
4. Chloride
5. Bromide
6. Oxalate
7. Borate
8. Fluoride
9. Phosphate

Cations

1. Lead
2. Copper
3. Cadmium
4. Nickel
5. Zinc
6. Manganese
7. Barium
8. Strontium
9. Calcium
10. Magnesium
11. Ammonium

The students are expected to analyze a minimum of 10 mixtures in their record note.

REFERENCE BOOKS:

1. V.V. Ramanujam, Inorganic Semi-micro Qualitative Analysis, 3rd Edition, The National Publishing Company, Chennai, 1974.
2. Vogel's TEXTBOOK of Quantitative Inorganic Analysis - A. I. Vogel, (Longman), Pearson education, India.
3. Advanced Practical Chemistry - R. Mukhopadhyay and P. Chatterjee, 2007; Arunabha Sen, Books &Alied (P) Ltd., Kolkata.
4. Advanced Practical Chemistry - N. K. Vishnoi, 2005; Vikas Publishing House, New Delhi.
5. Advanced Course in Practical Chemistry - Ghoshal, Mahapatra &Nad, 2000; New Central Book Agency (P) Ltd., Kolkata

IV SEMESTER			
AII-P2	**Allied Physics Practical-II**		**18UAPH4P1**
Hrs/Week: 2	**Hrs/Sem: 2x15=30**		**Credit: 1**

1. Young's modulus – Cantilever – depression
2. Lee's disc – Thermal Conductivity
3. Transistor Characteristics (CE mode)
4. Viscosity- capillary flow
5. Spectrometer Grating – Normal incidence
6. Newton's rings – Refractive Index of lens
7. LCR parallel circuit
8. NAND as universal gate
9. NOR as universal gate
10. Calibration of low range Ammeter- Potentiometer

Books for References:

1. Practical Physics - Ouseph, Srinivasan &Vijayendran,
2. Practical Physics – P. R. Sasi Kumar, PHI.
3. Advanced Practical Physics - S. P. Singh, Pragathi Prakasam.
4. Practical Physics – St. Joseph College, Trichy.

IV SEMESTER Part IV - Non-Major Elective			
NME-II	**CHEMISTRY IN EVERYDAY LIFE**		**18UNCH41**
Hrs / Week: 2	**Hrs / Sem: 30**	**Hrs / Unit: 6**	**Credit: 2**

UNIT: I Soaps and Detergents

Soaps - Definition - classification - raw materials used in the manufacture of soap - manufacture of toilet soap.

Detergents - Definition - various types with examples - advantages of detergents over soaps - cleaning action of soap.

UNIT: II Fertilizers

Definition - characteristics of a good fertilizer - role of nitrogen, potassium and phosphorous in plant growth - natural fertilizers - chemical fertilizers - urea, muriate of potash and triple superphosphate - mixed fertilizers - biofertilizers - advantages of biofertilizers.

UNIT: III Polymers

Fibres - Classification - uses of terylene, nylon and orlon

Resins - Natural resins - synthetic resins - type - uses of fevicol, quickfix, araldite, glyptal and Bakelite.

Plastics - Classification - differences between thermoplastics and thermosets - uses of polythene, PVC, polystyrene, Teflon and thermocole – Disadvantages of plastics.

Rubber - Types - Defects in natural rubber - vulcanization - synthetic rubbers - uses of neoprene, thiocol, butyl rubber, silicone rubber and foam rubber.

UNIT: IV Pharmaceutical Chemistry

Definition and therapeutic uses of the following important drugs (an elementary study only)

Antiseptics: alum, boric acid, Hydrogen peroxide
Antacids: Aluminium hydroxide
Analgesics: Aspirin, Paracetamol
Haematinics: Ferrous fumerate, ferrous gluconate
Laxatives: Epsom salt, milk of magnesia
Sedatives: Diazepam

UNIT: V Manufacture of Home Needs

An outline of the preparation and uses of the following articles.

Tooth powder, toothpaste, writing inks, gum paste, boot polish, talcum powder, chalk crayons, agar battis, moth balls and phenyle.

REFERENCE BOOKS:

1. Industrial Chemistry - B.K. Sharma, 2003, Goel Publishing House, Meerut.
2. Industrial Chemicals - Faith etal, Wiley Interscience, New York.
3. Chemical Process Industries - R.N. Shreve, 2000; Tata McGraw Hill Publishing Company, Mumbai.
4. TEXTBOOK of Pharmaceutical Chemistry - Jayashree Ghosh, 2003; S. Chand and Company, New Delhi.

V SEMESTER			
DSC 7	**PHYSICAL CHEMISTRY - II**		**18UCCH51**
Hrs/ Week: 6	**Hrs / Sem: 90**	**Hrs / Unit: 18**	**Credit: 4**

UNIT I – Thermodynamics-I

Reversible and irreversible process - isothermal and adiabatic process - relation among P - V, T - V and P - T during adiabatic changes - Expression for w, q, ΔE, ΔH, for 'n' moles of an ideal gas and van der Waals gas during reversible and irreversible isothermal and adiabatic processes - comparison of work done during reversible and irreversible process & isothermal and adiabatic expansion of an ideal gas - Joule - Thomson effect - Joule Thomson (JT) coefficient - Derivation of expression for Joule - Thomson coefficient for an ideal gas and a van der Waals gas - Inversion temperature - calculation and its significance.

UNIT II - Thermodynamics - II

Limitations of the first law of thermodynamics - Spontaneous process - Carnot cycle - different statement of second law of thermodynamics - Problems.Concept of entropy - dependence of entropy of variable of the system. Entropy changes of reversible, isothermal and adiabatic process of an ideal gas - Entropy changes during phase transitions - Entropy of mixing of ideal gas - physical significance of entropy - Free energy - Helmholtz free energy (A) and Gibbs free energy (G) - variation of free energy with T and P - Gibbs - Helmholtz equation - derivation and significance. - Clapeyron equation - applications - Clausius - Clapeyron equation and applications - Problems

UNIT III - Thermodynamics III

Partial molar properties - chemical potential - Gibbs - Duhem equation - derivation and significance - variation of chemical potential with temperature and pressure - chemical potential in a system of ideal gases

Concept of fugacity - physical significance of fugacity - activity - thermodynamics interpretation of law of mass action - derivation of van't Hoff isotherm and isochore.Thermodynamic derivation of relation between concentration and elevation of boiling point and depression of freezing point.

Nernst heat theorem - Third law of thermodynamics - statement – Residual determination of absolute entropy of solids and gases - Exception to third law of thermodynamics.

UNIT IV - Phase rule

Mathematical statement - definition of terms used - thermodynamic derivation - application of phase rule to one component system - Water, CO_2 and sulphur - Two component systems - condensed system and reduced phase rule - simple eutectic - Pb - Ag system - desilverisation of lead - KI - water system - Principle of freezing mixture.

Systems forming compounds with congruent and incongruent melting points - Sn - Mg and sodium sulphate - water systems.

Solid - Vapour equilibria - $CuSO_4$. H_2O system

Nernst distribution law - thermodynamic derivation - molecular association and dissociation - application of distribution law to benzoic acid - benzene, and $KI+I_2 \rightarrow KI_3$ system.

UNIT V - Solutions and dilute solutions

Raoult's law, Henry's law - Ideal and non - ideal solutions - Activity of a component in ideal solutions - Activity Coefficients- chemical potential in ideal and Non - ideal solutions - Gibbs - DuhemMargules equation - application - thermodynamics of ideal solution - ΔG_{mix}, ΔH_{mix} of ideal solution (No derivation) - vapour pressure of real solution - deviation from Raoult's law - theory of fractional distillation - benzene - toluene system, Azeotropic mixture - ethanol - water, HCl - H_2O, Immiscible liquids - theory of steam distillation - applications.

Solubility of partially miscible liquids - CST - Phenol - water, Triethylamine - water and nicotine - water systems - Crismer test.

REFERENCE BOOKS:

1. Principles of Physical Chemistry - B. R. Puri, L. R. Sharma, Madan S. Pathania, 2004, Vishal publishing co. - New Delhi
2. Thermodynamics for Chemists - Samuel Glasstone, 2000; Affiliated East - West Press private Ltd. New Delhi.
3. Physical Chemistry - G. M. Barrow, 2005; Tata McGraw Hill Publishing Company, New Delhi.
4. Physical Chemistry - G. R. Metz, 2004; Schaum's outlines, Tata McGraw Hill Publishing Company, New Delhi.
5. An introduction to chemical thermodynamics - R. P. Rastogi and R. R. Misra, 2005; Vikas Publishing House, New Delhi.

V SEMESTER			
DSC 8	**ORGANIC CHEMISTRY – II**		**18UCCH52**
Hrs / Week: 5	**Hrs / Sem: 75**	**Hrs / Unit: 15**	**Credit: 4**

UNIT I - Organic Reactions

Name reactions: Mechanism and applications of the following reactions: Aldol Condensation, Cannizzaro reaction, MPV reduction, Wolf - Kishner reduction, Clemenson reduction, Wittig reaction, Oppenaeur oxidation, Diels - Alder reaction, Gattermann reaction, Perkin's reaction, Claisen's reaction, Knovenagel reaction, Reimer - Tieman reaction and Kolbe reaction.

UNIT II - Stereochemistry and conformational analysis

Stereochemistry: Optical isomerism - optical activity - elements of symmetry - Optical activity of lactic acid, tartaric acid. Enantiomers and diastereoisomers - racemic and meso forms - Racemisation - Resolution of racemic mixtures, Walden inversion - Asymmetric synthesis - Compounds without asymmetric carbon - diphenyl, allenes and spiranes.

Chirality - achiral molecules - meaning of (+) and (-), D and L notations. Projection formulae - Fischer, Flying wedge, Sawhorse and Newmann Projection formulae Cahn - Ingold and Prelog rule - R, S - notation (with one and two asymmetric carbon atoms).

Geometrical isomerism – cis-trans isomerism, maleic acid and fumaric acid, Aldoxime and ketoxime. - E - Z notation. Methods of distinguishing geometrical isomers.

Conformational Analysis: Configuration and conformation, dihedral angle - Factors affecting the conformational stability. Conformational analysis of ethane, n – butane and cyclohexane (including energy diagrams).

UNIT - III - Reaction Mechanisms

Substitution reactions - S_N1 and S_N2 mechanism - effect of substrate - structure, nucleophile, leaving group and the solvent on nucleophilic substitution reactions. Differences between S_N1 and S_N2 reaction - Neighboring group participation due to n, пand σ electrons. S_N1', S_N2', S_Ni, S_Ni' mechanisms.

Elimination reactions - α and β eliminations - E1 and E2 mechanisms - effect of substrate structure, base, solvent and the leaving group on elimination. - Hoffmann, Saytzeff and Bredt'srule.

Addition reaction - stereochemistry of addition of halogen to C=C bond

UNIT - IV - Aromatic Substitution reactions

Mechanism of electrophilic aromatic mono - substitution (nitration, halogenation, sulphonation, Friedal Craft's alkylation, acylation) - Aromatic disubstitution - Korner'sabsolute method of orientation - Orientation effects of - OH, - NH_2, - X, - CH_3, - NO_2 and SO_3H on electrophilic substitution based on resonance concept - Rules of aromatic trisubstitution -

Nucleophilic aromatic substitution - Unimolecular, bimolecular and benzyne mechanism with examples - Homolytic aromatic substitution (side chain halogenations of alkyl benzenes)

UNIT - V - Heterocyclic Compounds

Heterocyclic compounds: Definition, preparation and properties of furan, pyrrole and thiophene. Comparison of pyrrole with phenol - Comparison of pyrrole with aromatic amines - Comparison of aromatic characters and basic nature of furan, pyrrole and thiophene.

Preparation (Hantzsch - pyridine) and properties of pyridine - Comparison of basic characters of pyridine with pyrrole, aliphatic and aromatic amines - Synthesis of quinoline (Skraup synthesis) - properties - Synthesis of isoquinoline (Bischler - Napiralski reaction) - properties - Synthesis of indole (Fischer - indole synthesis) - properties.

REFERENCE BOOKS:

1. Stereochemistry of carbon compounds - E.L. Eliel, 2005, Tata McGraw Hill Publishing Company.
2. Organic Chemistry: Natural Products - Volume I - O.P. Agarwal, 2004, Goel Publishing House, New Delhi.
3. Organic Chemistry - R.T. Morrison and R. N. Boyd, 4th edition, 1976; New York, Allyn and Bacon Ltd.
4. Organic Chemistry Vol. I and II, I. L Finar. (Sixth ed.,) 1996; Addison Wesley Longman Ltd., England.
5. Heterocyclic Chemistry, Raj K Bansal, 5th Edition, New Age International Publishers, New Delhi, 2010.

V SEMESTER			
DSC 9	**INORGANIC CHEMISTRY -III**		**18UCCH53**
Hrs / Week :5	**Hrs / Sem :75**	**Hrs / Unit :15**	**Credit :4**

UNIT I - Basic concepts in Coordination Chemistry

Definition, terminology, Calculation of Oxidation number in complexes, Types of ligands (Monodentate, Bidentate, Polydentate and bridging ligands) - Nomenclature of coordination compounds (IUPAC system). Geometrical isomerism in square planar and octahedral complexes - optical isomerism in tetrahedral complexes. Werner's coordination Theory. Effective Atomic Number rule (EAN). EAN for [Ni $(CO)_4$, $Fe(CO)_5$, $Cr(CO)_6$, $Mn_2(CO)_{10}$, $Co_2(CO)_8$ and $Fe_2(CO)_9$]

UNIT II - Coordination Chemistry I

VB theory - Prediction of hybridization - Crystal Field Theory - crystal field splitting of tetrahedral, square planar and octahedral systems - Factors affecting the value of Δ. Crystal field splitting energy (CFSE) values and its application in the stability of complexes.

Application of crystal field theory in spectral and magnetic properties - Distortion from perfect symmetry - Jahn - Tellar effect. Molecular orbital approach - MO diagrams for ML_6 type complexes - π - back bond coordination.

UNIT III - Coordination Chemistry II

Stability of Complexes in Solutions - stepwise stability constants and overall stability constant - log β value and stability. Factors affecting the stability of complexes in solution - Determination of stability constant by Bjerrum method

Chelate - chelate effect - explanation of chelate effect - Kinetic stability - labile and inert complexes - Trans effect.

UNIT IV - Spectral Properties of Complexes

Electronic spectra of complexes – LS coupling - microstate – Hund's rule – Term symbols – selection rules for electronic transition.

General energy diagrams of d^1 and d^9, d^4,d^6, d^2 and d^8,d^3,d^7(Orgel diagram) - Charge transfer spectra

UNIT V - Bio - inorganic Chemistry

Essential elements in biological systems - bulk, [C, H, N, O, P, S, Na, Ca, Mg], trace [Fe, Zn, Cu, Mo] and ultra - trace [As, Ni, Cd, Pb] elements in Biosystems - Metallo biomolecules - classification - Structure and functions of - hemoglobin, myoglobin, Chlorophyll, Vitamin B_{12}.

Na^+ and K^+ pumps and its functions. Metals and metal complexes in medicine [Platinum Complexes, Copper complexes, Gold complexes].

REFERENCE BOOKS:

1. Advanced Inorganic Chemistry Vol I, II - Sathyaprakash and R. D. Madan, Revised reprint 2005; S. Chand and Company, New Delhi
2. General and Inorganic Chemistry Vol I, II Revised reprint 2005; R. Sarkar, New Central Book Agencies, Kolkata
3. TEXTBOOK of Inorganic Chemistry - P. L. Soni and M. Katyl - 2004; Sulthan and sons, New Delhi
4. Advanced Inorganic Chemistry - F. A. Cotton and G. Wilkinson; 2003; John Wiley and sons INC.,
5. Inorganic Chemistry - J. E. Huheey, E. A. Keither and R. L. Keither, 2007; Addison Wesley publishing company.
6. Concise Coordination Chemistry - R. Gopalan and V. Ramalingam, 2001, Vikas publishing House.

V SEMESTER			
DSE 3A	**SPECTROSCOPY**		**18UECH5A**
Hrs / Week :4	**Hrs / Sem :60**	**Hrs / Unit :12**	**Credit :4**

UNIT I – Basic principles of spectroscopy & Microwave spectroscopy

Electromagnetic spectrum – different regions – electromagnetic radiation –Molecular spectra – Born-Oppenheimer approximation- types of molecular spectra –Factors influencing width and intensity of spectral transition.

Microwave (rotational) spectra – Principle, condition, selection rules - Applications (Calculation of bond length, Inversion spectrum of NH_3)- Microwave oven.

UNIT II - IR spectroscopy

Vibrational (IR) Spectra – selection rule– Harmonic oscillator – anharmonicity – Hooks' law-determination of force constant – Rotational – Vibrational spectra of diatomic molecules, - P,Q,R branches – Vibrational spectra of polyatomic molecules – normal modes of vibration of CO_2, H_2O. Vibrational frequencies – Factors affecting IR spectra – Finger print region – Fermi resonance-Applications (aliphatic and aromatic hydrocarbons, alcohols, aldehydes, ketones, carboxylic acid, ester, amide) – Intermolecular and intramolecular hydrogen bonding.

UNIT III - Raman and Electronic spectroscopy

Raman spectroscopy – Rayleigh and Raman scattering, Stokes and antistokes lines (Quantum theory)- Selection rule- Vibrational Raman spectra- Mutual exclusion principle- instrumentation Raman spectra of CO_2 and H_2O – Advantages and limitations of Raman Spectroscopy. Electronic spectra- principle – selection rule- Rotational structure of electronic-vibration spectra- Franck Condon principle.

UNIT IV – Mass Spectrometry

Basic theory- Instrumentation- Important useful terms in mass spectrometry: Mass spectrum, Base peak, Molecular ion and parent ion, mass to charge ratio (m/z), relative intensity, fragment ions, doubly charged ions, metastable ions- Even electron rule- Nitrogen rule and Mclafferty rearrangement - General Modes of fragmentation-Mass spectrum of 1-bromohexane, n-pentanol, cyclohexanol and phenol.

UNIT V - ESR and Mossbauer spectroscopy

ESR spectroscopy – principle- ESR spectrometer – hyperfine splitting – ESR spectrum of hydrogen atom, CH_3, deuterium, benzene anion radical - g-factor- Applications of ESR- Differences between NMR & ESR.

Mossbauer spectroscopy- Principle-Mossbauer experiment- Recoil Emission and absorption - Applications (Electronic structure, Molecular structure, Crystal symmetry and Magnetic structure).

REFERENCE BOOKS:

1. Spectroscopy- G. R. Chatwal, 5th Edition, 2017; Himalaya Publishing House, Mumbai.
2. Molecular structure and spectroscopy – G. Aruldhas 2005; Prentice Hall of India.
3. Fundamentals of molecular spectroscopy – C.N. Banwell, 2000; Tata McGraw Hill Publishing Company, Mumbai.
4. Organic spectroscopy Principles and Applications- Jag Mohan, 2nd edition, 2009, Narosa Publishing House, New Delhi.

V SEMESTER			
DSE 3B	**MEDICINAL CHEMISTRY**		**18UECH5B**
Hrs / Week: 4	**Hrs / Sem: 60**	**Hrs / Unit: 12**	**Credit: 4**

UNIT I- Concepts and metabolism of drugs

Concepts: Classifications of drugs – biological and chemical classification nomenclature of drugs – International Non-proprietary names (INNs).

Metabolism of drugs: Factors affecting metabolism - chemical pathway of drug metabolism – bio transformation - oxidative, reductive and hydrolytic bio transformations – conjugate reactions – glucouranides, amino acids, ethereal sulphate, methylated, acetylated and glucothione conjugations. Absorption of drugs – routes of administration – factors affecting absorption.

Assay of drugs: Chemical, biological and immunological assay.

UNIT II - Diagnostic Medical Instruments

Design of medical instruments – general components – transducers – types – biopotential recorders – Electrocardiograph (ECG) – principles, block diagram, measurement and analysis of the ECG.

X-ray - Principle, block diagram, measurement and analysis. Ultrasonic Scanning - principle, block diagram, measurement and analysis of the scans. C.T. Scan - principle, block diagram, measurement and analysis.

UNIT III - Clinical Chemistry

Clinical chemistry: Composition of blood – blood grouping - determination of blood groups and matching – blood pressure – hypertension – determination.

Determination of glucose in serum – Folin method, Wu's method - determination of serum cholesterol – Sackett's method – tests for cholesterol.

Estimation of glucose in urine – Benedict's test – tests for salts in serum – tests for chlorides in serum – tests for salts in urine – tests for cholesterol in urine.

Detection of diabetes and anaemia. Estimation of hemoglobin (Hb concentration) – estimation of red blood cells(count).

Analysis of blood – determination of blood urea – urease method.

Estimation of bile pigment in serum – estimation of total protein in serum – estimation of total proteins and albumin based on Biuret and BCG methods.

UNIT IV- Diseases and treatment I

Causes and treatment of some common diseases:

Insect borne diseases – malaria and filariasis.

Air borne diseases – diphtheria, woophing cough, influenza, cold, fever and tuberculosis.

Water borne – cholera, typhoid and dysentery.

Digestive disorders – jaundice – respiratory disorder – asthma – nervous disorder –epilepsy - other diseases – piles and leprosy.

Functions, uses and effects of the following drugs:

Cardiovascular drugs – antiarrythmic drugs - quinidine.

Anti hypertensive drugs - reserpine.

Anti anginal drugs - glyceryltrinitrate and isosorbidedinitrate.

Sulpha drugs – sulphanilide and sulphadiazine.

UNIT V - Diseases and treatment II

Cancer – causes, spread and treatment – structure and effects of chloram-Bucil (Leukeran), methotrexate (Anti-metabolite), plant products and hormones.

Diabetes – control – structure and uses of insulin - Oral hypoglycemic drugs – tolbutamide and chloropropanamide.

Anti-convulsant agents – structure and uses of barbiturates and succinimides.

Uses and effects of the following drugs:

Analgesics – narcotic analgesics – action, uses and structural activity of morphine.

Non-narcotic analgesics – asprin and paraacetamol.

Anaesthetic - generalanaesthetic – uses and disadvantages of vinlyl ether and halothane.

Intravenous anesthetics – tripental sodium – local anesthetics – cocaine and cincocaine.

Anti psychotic drugs – piperazine and benzamides.

Anti anxiety drugs – benzodiazepine.

REFERENCE BOOKS:

1. Practical Biochemistry – David Plummer – 2005, Tata McGraw-Hills PublishingCompany.
2. TEXTBOOK of Pharmaceutical Chemistry – Jeyashree Gosh – 2003, S. Chand and Company, New Dehi.
3. Medicinal Chemistry – G.R. Chatwal, 2002, Himalaya Publishing House, New Delhi.
4. Drugs – G.L.D. Krupadanam, D.V. Prasad, K.V. Rao, K.L.N.Reddy and C.Sudhakar, 2005; Orient LongmannPvt Limited, Hyderabad.
5. Handbook of Biomedical Instrumentation II Edition. – R. S. Khandpur, Tata McGraw - Hill Publishing, Company, New Delhi.

V SEMESTER		
DSCP-5	**GRAVIMETRIC ANALYSIS & CHROMATOGRAPHIC TECHNIQUE**	**18UCCH5P1**
Hrs / Week: 4	**Hrs / Sem: 60**	**Credit:2**

A. Gravimetric analysis

1. Estimation of Lead as Lead chromate
2. Estimation of Barium as Barium chromate
3. Estimation of Calcium as Calcium oxalate monohydrate
4. Estimation of Zinc as Zinc oxinate
5. Estimation of Nickel as Nickel Dimethyl glyoximate
6. Estimation of Copper as Copper thiocyanide [Course Work]

A. Chromatographic technique:

Thin layer chromatography: Separation of organic mixture containing *o* -, *m* - and *p* - nitrophenol using dioxane: Toluene (6:1) solvent system and the determination of R_f values of the separated components in a mixture.

REFERENCE BOOKS:

1. Vogel's TEXTBOOK of Quantitative Inorganic Analysis - A.I. Vogel, (Longman), Pearson education, India.
2. Advanced Practical Chemistry - R. Mukhopadhyay and P. Chatterjee, 2007; Arunabha Sen, Books &Alied (P) Ltd., Kolkata.
3. Advanced Practical Chemistry - N.K. Vishnoi, 2005; Vikas Publishing House, New Delhi.
4. Advanced Course in Practical Chemistry - Ghoshal, Mahapatra &Nad, 2000; New Central Book Agency (P) Ltd., Kolkata.
5. Instrumental Methods of Chemical Analysis, Gurdeep R. Chatwal and Sham Anand, 1997, Himalaya Publishing House, Mumbai.

V SEMESTER		
DSCP-6	**PREPARATION OF ORGANIC COMPOUNDS**	**18UCCH5P2**
Hrs / Week: 4	**Hrs / Sem: 60**	**Credit: 2**

Preparation of Organic Compounds

1. Benzoylation:
(a) Preparation of benzanilide from aniline
(b) Preparation of Phenylbenzoate from Phenol.

2. Nitration:
(a) Preparation of picric acid from phenol
(b)Preparation of p -nitro acetanilide from acetanilide

3. Bromination:
(a) Preparation of p -bromoacetanilide from acetanilide

4. Hydrolysis:
(a) Preparation of salicylic acid from methyl salicylate
(b) Preparation of Benzoic acid from Benzamide

5. Oxidation:
(a) Preparation of Benzoic acid from Benzaldehyde
(b) Preparation of *p*- Benzoquinone from Hydroquinone

6. Reduction:
(a) Preparation of Aniline from nitrobenzene
(b) Preparation of m- Nitroaniline from m- dinitrobenzene

7. Condensation:
Preparation of Osazone from Glucose [Course work].

8. Green Synthesis of the following compounds
a) Bromination of trans-stilbene
b) Bromination of acetanilide
c) Preparation of N-Benzyl Benzamide from Benzoic acid

REFERENCE BOOKS:

1. Vogel's TEXTBOOK of Quantitative Inorganic Analysis - A.I. Vogel,(Longman), Pearson education, India.
2. Advanced Practical Chemistry - R. Mukhopadhyay and P. Chatterjee, 2007; Arunabha Sen, Books &Alied (P) Ltd., Kolkata.
3. Advanced Practical Chemistry - N.K. Vishnoi, 2005; Vikas Publishing House, New Delhi.
4. Advanced Course in Practical Chemistry - Ghoshal, Mahapatra &Nad, 2000; New Central Book Agency (P) Ltd., Kolkata
5. College Practical Chemistry, V. K. Ahluwalia, Sunita Dhingra and Adarsh Gulati, 2005, Universities Press (India) Private Ltd., Hyderabad.
6. Monograph on Green Chemistry Laboratory experiments, Green Chemistry Task Force Committee, DST.

V SEMESTER			
SEC-I	**INDUSTRIAL CHEMISTRY**		**18USCH51**
Hrs / Week: 2	**Hrs / Sem: 30**	**Hrs / Unit: 6**	**Credit: 2**

Unit I- Match Industry & Explosives

Match industry: Safety matches – composition of match heads, composition of fireworks – coloured materials.

Explosives: Classification - High explosives - preparation of TNT explosive, glyceryl trinitrate, dynamite, cordite, nitrocellulose, PETN, HMX, dinol – Primary explosives – Lead azide, DDNP, Tetryl and EDNA.

Unit II- Fertilizers

Plant nutrients – Classification – Macronutrients – Micronutrients - functions, Need for fertilizers. Classification - Straight and Mixed fertilizers, Organic and Inorganic, Natural and Artificial fertilizers. Preparation of Triple superphosphate and Urea.

Unit III- Paper & Textile industry

Paper industry: Raw materials, manufacturing process – bleaching and coloring.

Textile chemistry: Fibres – natural and synthetic fibres, manufacture and uses of Rayon, Nylon, Dacron or Terylene, Orlon and Saron.

Unit IV- Cement industry

Introduction - Terminologies- Adhesion, Cohesion, Curing rate, Hygroscopicity, Deformability, Composition and Manufacture of Cement - Types of cement- Slag, Super sulphate, Coloured, Blended Portland cement, Properties, Testing and Uses - Corrosion of cement stone, Gypsum, Plaster of Paris.

Unit V – Soaps and Detergents

Soap- Raw materials, manufacture of Hard and Soft Soaps-Types- Toilet, Transparent and metal soaps. Cleansing action of Soaps.

Detergents- Synthetic detergents, Classification of surface-active reagents, Additives, Biodegradability of surfactants, Ecofriendly detergents- enzymes and zeolites, detrimental effects.

References

1. Advanced Inorganic Chemistry Volume I – Sathyaprakash and R. D. Madan, 2005; S. Chand and Company, New Delhi.
2. College Chemistry – J. L. Rosenberg and L. M. Epstein – 2004, Schaum's Outlines, Tata McGraw-Hill Publishing Company, New Delhi.
3. TEXTBOOKs of Inorganic Chemistry – G. S. Manku, 2004, Sultan Chand and Sons, New Delhi.
4. Industrial Chemistry – B.K. Sharma, Goel Publishing House, Meerut.

VI SEMESTER			
DSC 10	**PHYSICAL CHEMISTRY – III**		**18UCCH61**
Hrs / Week: 4	**Hrs / Sem: 60**	**Hrs / Unit: 12**	**Credit: 4**

UNIT I - Chemical Kinetics

Basic concept of chemical kinetics (order, molecularity, rate equation and $t_{1/2}$) - Second order reaction (same and different concentrations) and their rate equations, methods of determining order of a reaction - Problems.

Effect of temperature on reaction rates - Arrhenius equation, Activation energy - Energy barrier - effect of catalyst.

Theory of reaction rates - collision theory of bimolecular gaseous reaction - Activated complex theory of bimolecular reaction - Lindemann theory of unimolecular reaction -kinetics of H_2 - Cl_2, decomposition of HI reaction.

UNIT II - Photochemistry

Comparison between photochemical and thermal reaction - Beer - Lambert's law - Limitations - Laws of photochemistry - Grothus Draper law - Stark - Einstein law - Primary and secondary processes - Quantum yield - high and low quantum yield - experimental determination of quantum yield - chemical actinometer.

Consequences of light absorption - Jablonski diagram - fluorescence and phosphorescence - photochemical reaction - photochemical rate law

Energy transfer in photochemical reactions - Photosensitization and quenching - chemiluminescence - bioluminescence.Fast reaction - Flash photolysis, pulse radiolysis

UNIT III - Electrochemistry I

Transport number - Definition - determination by moving boundary method. Kohlrausch's law and its applications - Theory of strong electrolyte - Debye Huckel theory - significance of Debye - Huckel Onsager equation (derivation not required) - Conductometric titrations - different types - advantages. Solubility product - relationship between solubility and solubility product - Applications of solubility product and common ion effect in qualitative analysis. Salt hydrolysis - expression for hydrolysis constant and degree of hydrolysis for salts of different types.Calculation of pH of salt solutions (due to hydrolysis).

UNIT IV - Electrochemistry II

EMF - Electrochemical series and significances Reversible cells - representation - reaction for metal - metal ion, gas - ion, metal - sparingly soluble salt and redox electrodes. Standard cells - Weston Cadmium cell - thermodynamics of reversible / irreversible cells. Calculation of ΔH, ΔG, ΔS and equilibrium constant of cell reaction.

Nernst equation - Concentration cells - Expression for EMF of electrolyte concentration cells with and without transference. Liquid junction potential. Application of EMF measurements - determination of solubility product - determination of pH using quinhydrone, hydrogen, Glass electrodes - potentiometric titrations: acid - base, oxidation reduction and precipitation titrations.

UNIT V - Group Theory

Group theory - symmetry elements and symmetry operations - Identity (E), proper rotation axis (n), Mirror plane (σ), Inversion center (i) and rotation - reflection axis (S_n).

Symmetry operations generated by these symmetry elements using examples like H_2O, NH_3,BF_3, $PtCl_4^{2-}$, H_2O_2 (planar, *cis* and *trans*) and CH_4.

Condition for a set of elements to form a group - Abelian and cyclic groups - Group multiplication table - Molecular point groups - assignment of point groups to simple molecule like H_2O and NH_3

REFERENCE BOOKS:

1. Principles of Physical chemistry - B. R. Puri, L. R. Sharma, Madan S. Pathania, 2004, Vishal publishing Co. - New Delhi.
2. Physical Chemistry - G. M. Barrow, 2005; Tata McGraw Hill Publishing Company, New Delhi.
3. Electrochemistry - Principle and Applications. B. Viswanathan, . S. Sundaram, R. Venkataraman, K. Rengarajan and P. S. Raghavan, S. Viswanathan, 2000, Printers &Publishers Pvt.Ltd., Chennai, 1st Edition.
4. Group Theory and its Chemical Applications - P. K. Bhattacharya, 2005; Himalaya Publishing House, New Delhi.

VI SEMESTER			
DSC 11	**ORGANIC CHEMISTRY – III**		**18UCCH62**
Hrs / Week: 4	**Hrs / Sem: 60**	**Hrs / Unit: 12**	**Credit: 4**

UNIT I - Rearrangement reactions

Rearrangement reactions: Definition and classification - Mechanism and uses of the following rearrangement reactions.

Pinacol - Pinacolone, Benzilic acid, Beckmann, Benzidine, Hofmann, Curtius, Schmidt, Baker - Venkatraman and Fries (Inter, Intra and Photo) rearrangement. Sigmatropic rearrangement - Claisen rearrangement

UNIT II - Polynuclear Hydrocarbons

Isolated systems - preparation of diphenyl, triphenylmethane and stillbene - Condensed system - synthesis, reactions and structural elucidation of naphthalene, anthracene and phenanthrene - Preparation and properties of naphthyl amine, naphthols, naphthaquinones. Alizarin - synthesis and structural elucidation.

UNIT III - Alkaloids

Alkaloids: Definition, Classification - occurrence and General Methods of extraction - Hofmann exhaustive methylation (with coniine as example). Structural elucidation and synthesis of Coniine, Piperine and Nicotine.

UNIT IV – Terpenoids and Natural Pigments

Terpenes: Definition, Classification - Isoprene rule - Structural elucidation and synthesis of citral and Camphor.

Carotenoids - isolation and general properties - synthesis of β - carotene.

Flavones, isolation and general properties - structural elucidation and synthesis of Quercetin.

Anthocyanins - isolation, structure (elucidation not required).

UNIT V - Organic Spectroscopy

Applications of UV in alkenes - Woodward Fischer rule - Calculation of absorption maxima (λ_{max}) of α, β - unsaturated carbonyl compounds, Conjugated and isolated dienes - Scott rule.

NMR – Principle - Larmor precession – Position and Number of Singals- Chemical shift - Factors affecting Chemical Shift - Spin-Spin coupling – Relaxation effect- application of NMR to Ethanol, Acetaldehyde, Benzaldehyde, Ethylmethyl ketone, Nitromethane, Ethylacetate, Aniline.

Roadmap problems based on UV - Visible, IR and NMR spectra.

REFERENCE BOOKS:

1. Organic Chemistry: Natural Products - Volume I - O. P. Agarwal, 2004, Goel Publishing House, New Delhi.
2. Organic Chemistry - R. T. Morrison and R. N. Boyd, 4th edition, 1976; New York Allyn and Bacon Ltd.
3. Organic Chemistry Vol. I and II, I. L Finar. 6th Edition, 1996; Addison Wesley Longman Ltd., England.
4. Spectroscopy- G. R. Chatwal, 5th Edition, 2017; Himalaya Publishing House, Mumbai.
5. Organic spectroscopy Principles and Applications- Jag Mohan, 2nd Edition, 2009, Narosa Publishing House, New Delhi.
6. Fundamentals of molecular spectroscopy – C.N. Banwell, 2000; Tata McGraw Hill Publishing Company, Mumbai.

VI SEMESTER		
DSC-12	**PROJECT**	**18UCCH63**
Hrs / Week: 6	**Hrs / Sem: 90**	**Credit: 6**

GUIDELINES:

1. The project may be done individually or in groups not exceeding five per group.
2. The minimum length of the project should be 30 pages in A4 size.
3. Marks for the project report will be 100 divided as 60% for the project and 40% for viva – voce.

Evaluation scheme:

The project will be evaluated by both Internal and External Examiners. Each Examiner will evaluate for 100 marks. The allocation of marks for project is as follows:

Project	**Internal**	**External**
Word of title	5	5
Objectives / Formulation including Hypothesis	5	5
Review of literature	10	10
Relevance of project to social needs	5	5
Methodology / Technique / Procedure adopted	20	20
Summary / Findings / Summation	5	5
Works cited / Annexure / Footnotes	10	10
Total	**60**	**60**

VI SEMESTER			
DSE 4A	**INSTRUMENTAL METHODS OF ANALYSIS**		**18UECH6A**
Hrs / Week: 4	**Hrs / Sem: 60**	**Hrs / Unit: 12**	**Credit: 4**

UNIT I - Thermo Analytical Methods

Thermo Gravimetric Analysis (TGA) – principle, Derivative thermogravimetric analysis – Factors affecting TGA - applications. Differential Thermal Analysis- Principle and applications – Thermometric titrations – Principle and applications – DSC – Principle and applications.

UNIT II Electro Analytical Methods

Electro Gravimetric Analysis – theory – instrumentation– applications – Estimation of metal ions (Cu^{2+} and Ni^{2+}). Coulometric analysis, coulometric titrations – applications. Polarography – principle – dropping mercury electrode – experimental assembly – Polarographic curves – applications to qualitative and quantitative analysis – Amperometrictitrations – Principle and applications.

UNIT III - Colorimetric and Spectrophotometric Analysis

Visible colorimetry –Nessler's method – instrumentation and applications.

UV Spectroscopy – Theory – types of electronic transitions- chromophores – auxochrome - Bathochromic, Hyperchromic, Hypsochromic and Hypochromic shifts - solvent effect – instrumentation single and double beam spectrophotometer

UNIT IV – IR& NMR Spectroscopy

IR spectroscopy - Instrumentation of IR spectrometer.

NMR spectroscopy – Instrumentation and Applications - Analysis of a mixture of *o*- and *p*- xylenes in an isomeric mixture and determination of hydrogen bonding - MRI.

UNIT V - Spectroscopy- II

Flame photometry – principle – instrumentation and applications.

Atomic absorption spectroscopy – Theory and instrumentation – applications (Chromium in steel and Calcium in blood serum).

Nephelometry and turbidimetry – Principle, Instrumentation and applications.

Fluorometry – principle – instrumentation and applications.

REFERENCE BOOKS:

1. Fundamentals of Analytical Chemistry – D. A. Skoog, D.M. West, F.J. Holler and S.R. Crouch – 2004; Thompson Asia Private Ltd., Bangalore.
2. Industrial Chemistry - B.K Sharma, Goel Publishing House, Meerut.
3. Instrumental Methods of Analysis – B. K. Sharma, Gel publishing House, Meerut.
4. Contemporary Chemical Analysis - Judith F. Rubinson, Prentice Hall (India).
5. Instrumental Methods of Chemical Analysis- Gurdeep R. Chatwal and Sham Anand, 2017, Himalaya Publishing House, Mumbai

VI SEMESTER			
DSE-4B	**FOOD CHEMISTRY**		**18UECH6B**
Hrs / Week: 4	**Hrs / Sem: 60**	**Hrs / Unit: 12**	**Credit: 4**

Unit-I Constituents of food

Introduction, Classification of Carbohydrates. Qualitative analysis of amino acids - Glycine, tyrosine, tryptophan, arginine and cysteine. Carbohydrates - Qualitative analysis of monosaccharides (glucose, fructose, galactose) Quantitative Analysis of proteins - Estimation of protein by colorimetric method & Estimation of protein in milk by Kjheldal method and Estimation of Ascorbic acid (vitamin C) using sodium-2,6-dichloroindophenol dye.

Unit– II Food Adulteration

Adulterants: Common adulterants in different foods – milk and milk products, vegetable oils, and fats, spices and condiments, cereals, pulses, sweetening agents and beverages. Contamination with toxic chemicals – pesticides and insecticides. Principles involved in the analysis of detection and prevention of food adulteration.

Unit– III Food additives:

Artificial sweeteners – saccharin, cyclomate, asparatame – food flavours, – esters, aldehydes and heterocyclic compounds. Antioxidants. Food colours – changes in cooking. Restricted use. Spurious colours. Emulsifying agents, preservatives – leaveningagents. Baking powder –Yeast. Taste enhancers – MSG-vinegar

Unit– IV Beverages

Fruit juices –Nitrogen preservation and packing of fruit juices- soft drinks-soda. Excessive use of soft drinks leading to urinary bladder stones – cirrhosis of liver.

Unit– V Quality control:

Specifications and standards: PFA, FPO, FDA, WHO standards, ISI specifications**,** packing and label requirements, essential commodities act, consumer protection act. AGMARK.

Reference Books

1. 1.Swaminathan M. Advanced TEXTBOOK on Food and Nutrition, volume I and II Printingand Publishing CO., Ltd., Bangalore. *1993.*
2. 2.Swaminathan M. TEXTBOOK on Food chemistry, Printing and Publishing CO., Ltd., Bangalore. *1993.*
3. 3.Norman N. Potter, Food science, CBS publishers and distributors, New Delhi. *1994.*
4. Lillian Hoagoland Meyer, Food Chemistry, CBS publishers and distributors, New Delhi.*1994.*
5. Owen R Fennema, Food Chemistry, Marcel Decker Inc., New York. *1996.*
6. Srilakshmi B., Food Science, New age International Pvt. Ltd. Publishers, III ed. *2003.*
7. Siva Sankar B., Food Processing and Preservation. Prentice – Hall of India Pvt. Ltd., NewDelhi.*2002.*
8. Ramakrishnan S., Prasannam K.G and Rajan R –Principles. TEXTBOOK of medical biochemistry. Orient Longman Ltd. III ed. 2001.
9. Shakuntala Manay N. and Shadaksharaswamy M. FOODS: Facts and Principles. New ageInternational Pvt. Ltd. Publishers, II ed. 2002.

VI SEMESTER		
DSCP-7	**PHYSICAL CHEMISTRY AND COMPUTER IN CHEMISTRY ***	**18UCCH6P1**
Hrs / Week: 4	**Hrs / Sem: 60**	**Credit: 2**

1. Determination of molecular weight of non -volatile solute by Rast macro method.
2. Determination of molecular weight of a solute by transition temperature method.
3. Construction of the phase diagram of a simple eutectic system and interpretation of the diagram (Example; Naphthalene – Biphenyl)
4. Determination of CST of phenol – water system. Determination of the unknown concentration of NaCl, by CST using phenol water system.
5. Comparison of the strengths of HCl by ester hydrolysis.
6. Conductometric titration:
   a. Determination of the strength of HCl using standard NaOH solution.
   b. Determination of the strength of $BaCl_2$ using Std.$MgSO_4$.
   c. Determination of the strength of CH_3COOH using Std. NaOH.
   d. Determination of the strength of Ba $(OH)_2$ using std.$MgSO_4$.
7. Potentiometric titration
   a. Estimation of Fe^{2+} Vs $KMnO_4$ Vs FAS solution (standard solution of FAS has to be prepared).
   b. Estimation of $KMnO_4$ Vs FAS and $KMnO_4$ Vs $K_2Cr_2O_7$ solution (standard solution of FAS has to be prepared).
8. Determination of the solubility of Ammonium Oxalate at different temperature.
9. Computer practical's: Solving problems by writing and running programs in C++ and exciting the output (Course Work)
   a) Determination of pH of a solution and find that it is basic, acidic or neutral
   b) Compute the rate constant of a first order reaction
   c) Determination of half -life and average -life of a radioactive nuclei
   d) Compute the average velocity & MPV using RMS velocity
   e) Depression of freezing point
   f) Inversion temperature and critical constant.
   g) Elevation of boiling point.

REFERENCE BOOKS:

1. Vogel's TEXTBOOK of Quantitative Inorganic Analysis - A.I. Vogel, (Longman), Pearson education, India.
2. Advanced Practical Chemistry - R. Mukhopadhyay and P. Chatterje, 2007; Arunabha Sen, Books &Alied (P) Ltd., Kolkata.
3. Advanced Practical Chemistry - N.K. Vishnoi, 2005, Vikas Publishing House, New Delhi.
4. Advanced Course in Practical Chemistry - Ghoshal, Mahapatra &Nad, 2000; New Central Book Agency (P) Ltd., Kolkata.

VI SEMESTER		
DSCP – 8	**ORGANIC ANALYSIS**	**18UCCH5P2**
Hrs / Week: 4	**Hrs / Sem: 60**	**Credit: 2**

Systematic analysis of the organic compound with the view to find out the following:

a. Detection of extra element (N, S and halogens)
b. Aliphatic or aromatic
c. Saturated or unsaturated
d. Nature of the functional group (Phenolic, carbonyl, monocorboxylic acid, dicarboxylic acid, esters, carbohydrate (glucose), aromatic primary amine, amide, nitro compound, anilide)
e. Preparation of rational solid derivatives to confirm the functional group.

REFERENCE BOOKS:

1. Vogel's TEXTBOOK of Quantitative Inorganic Analysis - A.I. Vogel, (Longman), Pearson education, India.
2. Advanced Practical Chemistry - R. Mukhopadhyay and P. Chatterjee, 2007; Arunabha Sen, Books &Alied (P) Ltd., Kolkata.
3. Advanced Practical Chemistry - N.K. Vishnoi, 2005; Vikas Publishing House, New Delhi.
4. Advanced Course in Practical Chemistry - Ghoshal, Mahapatra &Nad, 2000; New Central Book Agency (P) Ltd., Kolkata
5. College Practical Chemistry, V. K. Ahluwalia, Sunita Dhingra and Adarsh Gulati, 2005, Universities Press (India) Private Ltd., Hyderabad.

VI SEMESTER			
SEC-II	**PHARMACEUTICAL CHEMISTRY**		**18USCH61**
Hrs / Week: 2	**Hrs / Sem: 30**	**Hrs / Unit: 6**	**Credit: 2**

UNIT-I IMPORTANT TERMINOLOGIES, CLASSIFICATION AND ASSAY

Important terminologies - pharmacology, molecular pharmacology, pharmacophore, metabolites, anti-metabolites, virus, bacteria, fungi, pharmacognosy, pharmacotherapeutics, toxicology, chemotherapy – classification of drugs – nomenclature of drugs – nonproprietary names

UNIT-II MECHANISMS, METABOLISMS AND MEDICINAL PLANTS

Mechanism of drug action – absorption, drug delivery, drug excretion – Metabolism of drugs –chemical pathways of drug metabolism – phase – I (oxidative, reductive and hydrolytic reactions) and phase - II (conjugate reactions).

Indian medicinal plants – Tulsi, neem, Keezhanelli, adathode, thoothuvalai

UNIT- III DRUGS AND FUNCTIONS

Analgesics- Non-narcotic analgesics –aspirin and paracetamol. Anaesthetics- local anaesthetics –procaine- General anaesthetics- chloroform and halothane. Antibiotics – Therapeutical values of penicillin, tetracyclines, chloramphenicol and streptomycin. Sulpha drugs – sulphanilide, sulphadiazine and cotrimoxazole. Antiseptics and disinfectants – phenols, chloramine-T.

UNIT-IV DISEASES AND TREATMENT

Composition of blood – blood grouping and matching – Rh factor. Blood pressure – causes, control and treatment- antihypertension drugs- antianginal agents cardiovascular drugs, cardiacglycosides, vasodilators (one example for each). Aneaemia – causes and control – antianemic drugs.

UNIT- V COMMON DISEASES AND HEALTH CARE MEDICINES

Common diseases – causes and treatment of insect borne diseases (Malaria and Filariasis), Airborne diseases (Diptheria, Whooping cough, Influenza, common cold, TB) and Water borne diseases (Cholera, Typhoid and Dysentery). Digestive disorder – Jaundice.Respiratory disorder –Asthma.

REFERENCE BOOKS:

1. A TEXTBOOK of Pharmaceutical chemistry, Jayashree ghosh, S. Chand, 2003.
2. Pharmaceutical Chemistry by S. Lakshmi, Sultan Chand & Sons, 3rd edition (2004).
3. Medicinal Chemistry, Ashutosh kar, New Age International, 1992
4. Pharmaceutical chemistry – G.R. Chatwal
5. Pharmacology and Pharmatherapeutics – R.S. Satoskar and S.D. Bhandarkar.
6. Drugs, G.L.D. Krupadanam, D.V. Prasad, K.V. Rao, K.L.N.Reddy and C.Sudhakar,Tata McGraw- Hill Publishing Company,New Delhi.
7. Medicinal chemistry, G.R. Chatwal, Himalaya Publishing House, New Delhi (2002)

VI SEMESTER			
SBC	**PERSONALITY DEVELOPMENT**		**18USPD62**
Hrs / Week: 2	**Hrs / Sem: 30**	**Hrs / Unit: 6**	**Credits:2**

UNIT -I

PERSONALITY - Definition – Determinants – Personality Traits –Theories of Personality – Importance of Personality Development. **SELF AWARENESS** – Meaning – Benefits of Self – Awareness – Developing Self – Awareness. **SWOT** – Meaning – Importance- Application – Components.

UNIT – II

SELF MONITORING – Meaning –Advantages and Disadvantages self-monitor- Self –monitoring and job performance. **PERCEPTION**- Definition-Factor influencing perception- Perception process. **ATTITUDE** – Meaning-Formation of attitude – Types of attitude - Measurement of Attitudes. **ASSERTIVENESS** - Meaning – Assertiveness in Communication – Assertiveness Techniques.

UNIT – III

TEAM BUILDING – Meaning – Types of teams – Importance of Team building- Creating Effective Team. **LEADERSHIP** – Definition – Leadership style– Qualities of an Effective leader. **NEGOTIATION SKILLS** – Meaning – Principles of Negotiation – Types of Negotiation – The Negotiation Process. **CONFLICT MANAGEMENT** – Definition- Types of Conflict- Levels of Conflict.

UNIT –IV

COMMUNICATION – Definition – Importance of communication – Process of communication–Barriers in communication – Overcoming Communication Barriers. **EMOTIONAL INTELLIGENCE**: Meaning – Components of Emotional Intelligence- Significance of managing Emotional intelligence. **STRESS MANAGEMENT** – Meaning – Sources of Stress – Symptoms of Stress – Consequences of Stress – Managing Stress.

UNIT – V

SOCIAL GRACES – Meaning – Social Grace at Work – Acquiring Social Graces. **TABLE MANNERS** – Meaning – Table Etiquettes in Multicultural Environment- Do's and Don'ts of Table Etiquettes. **DRESS CODE** – Meaning- Dress Code for selected Occasions – Dress Code for an Interview. **GROUP DISCUSSION** – Meaning – Personality traits required for Group Discussion- Process of Group Discussion**. INTERVIEW** – Definition- Types of skills – Employer Expectations –Planning for the Interview – Interview Questions- Critical Interview Questions.

References:

1. Dr.S. Narayana Rajan, Dr. B. Rajasekaran, G. Venkadasalapthi, V. VijureshNayaham and Herald M. Dhas, **Personality Development**, Publication Division, ManonmaniamSundaranar University, Tirunelveli
2. Stephan P. Robbins, **OrganisationalBehaviour**, Tenth Edition, Prentice Hall of India Private Limited, New Delhi,2008
3. Jit S. Chandan, **OragnisationalBehaviour**, Third Edition, Vikas Publishing House Private Limited, 2008
4. Dr.K.K. Ramachandran and Dr.K.K. Karthick, **From Campus to Corporate**, Macmillan Publishers India Limited, New Delhi, 2010.

SCHEME OF EXAMINATIONS UNDER CBCS (2018 - 2021)

The medium of instruction in all UG and PG courses is English, and students must write the CIA Tests and Semester Examinations in English.

DISTRIBUTION OF MARKS FOR CIA AND SEMESTER EXAMINATIONS UNDERGRADUATE, CERTIFICATE & DIPLOMA COURSES

SUBJECT	TOTAL MARKS	CIA TEST	SEMESTER EXAMINATION	PASSING MINIMUM		
				CIA TEST	SEM. EXAM.	OVERALL
Theory	100	25	75	Nil	30	40
Practical (4 hrs)	100	40	60	Nil	24	40
Practical (2 hrs)	50	20	30	Nil	12	20
Project	100	Nil	Report - 60 marks Viva Voce - 40 marks	Nil	Nil	40

DIVISION OF MARKS FOR CIA TEST

SUBJECT	MARKS	ASSIGNMENT FOR UG / ASSIGNMENT OR SEMINAR FOR PG	RECORD NOTE	TOTAL MARKS
Theory	20	5	--	**25**
Practical (4 hrs)	30	--	10	**40**
Practical (2 hrs)	15	--	5	**20**

1. The duration of each CIA Test is ONE hour and the Semester Examination is THREE hours.
2. Three CIA tests of 20 marks each will be conducted and the average marks of the best two tests out of the three tests will be taken.
3. The I test will be based on the first 1.5 units of the syllabus, the II test will be based on the next 1.5 units of the syllabus and the III test will be based on the next 1.5 units of the syllabus.
4. Two assignments for Undergraduate, Certificate, Diploma and Advanced Diploma Courses and two assignments OR two seminars for Postgraduate Courses has to be submitted.
5. The duration and the pattern of question paper for practical examination may be decided by the respective Boards of Studies. However, out of 60 marks in the semester practical examination, 10 marks may be allotted for record and 50 marks for practical.
6. Two internal practical tests of 30/15 marks each will be conducted for science students in the respective semester and the average will be taken. The record marks allotted for the above practical are 10 and 5 respectively.

QUESTION PAPER PATTERN FOR CIA TEST (THEORY)

Duration: 1 Hr **Maximum Marks: 20**

Section	Question Type	No. of Questions & Marks	Marks
A	No Choice Answer should not exceed 75 words	2 Questions 2 marks each	2 x 2 = 4
B	Internal choice (Either or type) Answer should not exceed 200 words	2 Questions 4 marks each	2 x 4 = 8
C	Open Choice (Answer ANY ONE out of Two) Answer should not exceed 400 words	1 Question 8 marks	1 x 8 = 8
		TOTAL	**20 MARKS**

QUESTION PAPER PATTERN FOR SEMESTER EXAMINATION (THEORY)

Duration: 3 Hrs **Maximum Marks: 75**

Section	Question Type	No. of Questions & Marks	Marks
A	No Choice Answer should not exceed 75 words	10 Questions - 2 marks each (2 Questions from each unit)	10 x 2 = 20
B	Internal choice (Either or type) Answer should not exceed 200 words	5 Questions with internal choice. Each carry 5 marks (Two questions from each unit)	5 x 5 = 25
C	Open Choice (Answer ANY THREE out of FIVE) Answer should not exceed 400 words	3 Questions out of 5 - 10 marks each (1 Question from each unit)	3 x 10 = 30
		TOTAL	**75 MARKS**