

BACHELOR OF SCIENCE IN CHEMISTRY

**SYLLABUS 2018-19
(Outcome Based Education)**



Dr. N.G.P. ARTS AND SCIENCE COLLEGE

(An Autonomous Institution, Affiliated to Bharathiar University, Coimbatore)

Approved by Government of Tamil Nadu and Accredited by NAAC with 'A' Grade (2nd Cycle)

Dr. N.G.P.- Kalapatti Road, Coimbatore-641048, Tamil Nadu, India

Web: www.drngpasc.ac.in | Email: info@drngpasc.ac.in | Phone: +91-422-2369100

REGULATIONS

ELIGIBILITY

A pass in Higher Secondary Examination with Mathematics, Physics, Chemistry, Biology/Computer Science as per the norms set by the Government of Tamil Nadu or an Examination accepted as equivalent there to by the Academic Council, subject to such conditions as may be prescribed there to are permitted to appear and qualify for the **Bachelor of Chemistry** Degree examination of this College after a programme study of three academic years.

OBJECTIVES OF PROGRAMME

The Curriculum is designed to attain the following learning goals which students shall accomplish by the time of their graduation:

1. To understand the interdisciplinary nature of chemistry and to integrate knowledge of mathematics, physics and other disciplines to a wide variety of chemical problems.
2. To enable the students to learn laboratory skills to design, safely conduct and interpret chemical research.
3. To develop the ability to effectively communicate scientific information and research results in written and oral formats.
4. To provide a broad foundation in chemistry that stresses scientific reasoning and analytical problem solving with a molecular perspective.
5. To make students learn professionalism, including the ability to work in teams and apply basic ethical principles.

SCHEME OF EXAMINATION

Course Code	Course	Hrs of Instruction	Exam Duration (Hrs)	Max Marks			Credit Points
				CA	CE	Total	
First Semester							
Part - I							
17UTL11T 17UHL11H 17UML11M 17UFL11F	Tamil -I Hindi -I Malayalam - I French -I	5	3	25	75	100	3
Part - II							
18UEG12G	English - I	5	3	25	75	100	3
Part - III							
18UCY13A	Core I: General Chemistry - I	7	3	25	75	100	5
	Core Practical I: Inorganic Qualitative Analysis	4	-	-	-	-	-
17UPY1AA	Allied Paper - I : Physics - I	4	3	20	55	75	3
	Allied Practical - I : Physics	3	-	-	-	-	-
Part - IV							
17UFC1FA	Value Education: Environmental Studies*	2	2	-	50	50	2
		30				425	16
Second Semester							
Part - I							
17UTL21T 17UHL21H 17UML21M 17UFL21F	Tamil -II Hindi -II Malayalam - II French -II	5	3	25	75	100	3
Part - II							
18UEG22G	English - II	5	3	25	75	100	3
Part - III							
18UCY23A	Core II: General Chemistry - II	7	3	25	75	100	5

[Signature]
20/12/2019

BoS Chairman/HoD
Department of Chemistry
Dr. N. G. P. Arts and Science College
Coimbatore - 641 048



17UCY23P	Core Practical I: Inorganic Qualitative Analysis	4	3	40	60	100	4
17UPY2AA	Allied Paper - II : Physics - II	4	3	20	55	75	3
17UPY2AP	Allied Practical - I : Physics	3	3	20	30	50	3
Part - IV							
17UFC2FA	Value Education: Human Rights*	2	2	-	50	50	2
		30				575	23
Third Semester							
Part - I							
17UTL31T 17UHL31H 17UML31M 17UFL31F	Tamil -III Hindi -III Malayalam - III French -III	4	3	25	75	100	3
Part - II							
17UEG32E	English - III	4	3	25	75	100	3
Part - III							
17UCY33A	Core III: General Chemistry - III	6	3	25	75	100	5
	Core Practical II: Volumetric and Organic analysis	4		-	-	-	-
17UMT3AB	Allied Paper – III: Mathematics- I	5	3	20	55	75	3
17UCY3SA	Skill Based Course – I: Water Chemistry	3	3	20	55	75	3
Part - IV							
	NMEC - I	2	2	-	50	50	2
17UFC3FA 17UFC3FB 17UFC3FC 17UFC3FD 17UFC3FE	Basic Tamil/ Advanced Tamil (or) Yoga for human excellence/ Women’s Rights/Constitution of India	2*	2	-	50	50	2
		30				550	21
Fourth Semester							

Part - I							
17UTL41T	Tamil - IV	4	3	25	75	100	3
17UHL41H	Hindi - IV						
17UML41M	Malayalam - IV						
17UFL41F	French -IV						
Part - II							
17UEG42E	English - IV	4	3	25	75	100	3
Part - III							
17UCY43A	Core IV: General Chemistry - IV	6	3	25	75	100	5
17UCY43P	Core Practical II: Volumetric and Organic analysis	4	6	40	60	100	4
17UMT4AB	Allied Paper – IV: Mathematics- II	5	3	20	55	75	4
17UCY4SA	Skill Based Course II: Food Chemistry	3	3	20	55	75	3
Part - IV							
	NMEC - II	2	2	-	50	50	2
17UFC4FA	Basic Tamil/	2*	2	-	50	50	2
17UFC4FB	Advanced Tamil (or)						
17UFC4FC	General Awareness						
		30				650	26
Fifth Semester							
Part - III							
17UCY53A	Core V : Inorganic Chemistry - I	5	3	25	75	100	5
17UCY53B	Core VI: Organic Chemistry - I	4	3	25	75	100	4
17UCY53C	Core VII: Physical Chemistry - I	4	3	25	75	100	4
	Core practical III: Gravimetric analysis and Inorganic preparation	3	-	-	-	-	-
	Core practical IV: Physical chemistry experiments	3	-	-	-	-	-

	Elective: I	4	3	20	55	75	4
	Elective-II	4	3	20	55	75	4
17UCY5SA	Skill Based Course III: Industrial Chemistry	3	3	20	55	75	3
17UCY53T	Industrial Training	Grade A to C					
		30				525	24
Sixth Semester							
Part- III							
17UCY63A	Core VIII: Inorganic Chemistry -II	5	3	25	75	100	5
17UCY63B	Core IX: Organic Chemistry - II	4	3	25	75	100	4
17UCY63C	Core X: Physical Chemistry - II	4	3	25	75	100	4
17UCY63P	Core practical III: Gravimetric analysis and Inorganic preparation	3	3	40	60	100	3
17UCY63Q	Core practical IV: Physical Chemistry experiments	3	3	40	60	100	3
	Elective: III	4	3	20	55	75	4
17UCY63R	Core practical V: Application oriented practical	4	3	30	45	75	2
17UCY6SA	Skill Based Course IV: Textile Chemistry	3	3	20	55	75	3
17UEX65A	Extension Activities	-	-	-	50	50	2
		30				775	30
Grand Total						3500	140

* - Instruction hours given to placement

ELECTIVE - I

(Student shall select any one of the following Course as Elective - I in fifth semester)

Elective	Course Code	Name of the Course
1	17UCY5EA	Spectroscopy and Chromatography
2	17UCY5EB	Agricultural Chemistry
3	17UCY5EC	Pharmaceutical Chemistry

ELECTIVE - II

(Student shall select any one of the following Course as Elective - II in fifth semester)

Elective	Course Code	Name of the Course
1	17UCY5ED	Dye Chemistry
2	17UCY5EE	Nano and Green Chemistry
3	17UCY5EF	Forensic Science and Crime Investigation

ELECTIVE - III

(Student shall select any one of the following Course as Elective - III in sixth semester)

Elective	Course Code	Name of the Course
1	17UCY6ED	Polymer Chemistry
2	17UCY6EF	Dairy Chemistry
3	17UCY6EG	Leather Chemistry

NON MAJOR ELECTIVE COURSES

- The Department offers the following two papers as Non Major Elective Courses for other than the Chemistry students.
- Student shall select any one of the following subject as Non Major Elective Courses during their III and IV semester

Extra Departmental Course papers offered by Department of Chemistry

S. No.	Semester	Course Code	Course Title
1.	III	17UNM34Y	Chemistry in Daily life - I
2.	IV	17UNM44Y	Chemistry in Daily life - II

FOR PROGRAMME COMPLETION

Students have to complete the following:

- Part I, II, III, IV and V as mentioned in the scheme.
- Industrial training: Course code 17UCY53T.
 - Student must undergo Industrial training for 15 days during Summer Vacation in IV Semester. Internal and external Examiner will evaluate the report in V Semester. Based on the performance Grade will be awarded as follows:
 - A- 75 marks and above
 - B- 60-74 marks
 - C- 40-59 marks
 - Below 40 marks – Re Appear

Total Credit Distribution

Courses	Credits	Total		Credits	Cumulative Total
Part I: Tamil	3	04 x 100	400	12	24
Part II: English	3	04 x 100	400	12	
Part III:					
Core	5	06 x 100	600	30	102
Core	4	04 x 100	400	16	
Core Practical	4	02 x 100	200	08	
Core Practical	3	02 x 100	200	06	
Core Practical	2	01 x 75	075	02	
Allied Theory	3	03 x 75	225	09	
Allied Theory	4	01 x 75	075	04	
Allied Practical	3	01 x 50	050	03	
Elective	4	03 x 75	225	12	
Skill based Course Theory	3	04 x 75	300	12	
Part IV:					
Value Education	2	02 x 50	100	04	12
Women’s Rights	2	01 x 50	050	02	
General awareness	2	01x 50	100	02	
NMEC	2	02 x 50	100	04	
Part V:					
Extension Activity	2	01 x 50	50	02	02
Total			3500	140	140

Earning Extra credits is **NOT MANDATORY** for programme completion.

Extra credits

Courses	Credit	Total credits
BEC/ Self study courses	1	1
Hindi / French/ Other foreign Language approved by certified Institutions	1	1
Type Writing / Short Hand Course	1	1
Diploma/certificate/CA/ ACS/CMA Foundation	1	1
Representation – Academic/Sports /Social Activities/ Extra Curricular / Co-Curricular activities at University/ District/ State/ National/ International	1	1
Total		5

Rules:

The students can earn extra credits only if they complete the above during the programme period (I to V semester) and based on the following criteria. Proof of Completion must be submitted in the office of the Controller of Examinations before the commencement of the VI Semester. (Earning Extra credits are not mandatory for programme completion)

1. Student can opt BEC course/ Self study course to earn one credit. They have to Enroll and complete any one of the course during their programme period before fifth semester (I semester to V semester).

Self Study Courses offered by the Department of Chemistry

S. No.	Semester	Course Code	Course Title
1.	III Semester	17UCYSS1	Chemistry in the service of Mankind
2.		17UCYSS2	Cosmetic Chemistry

- Student can opt Hindi/ French/ Other foreign Language approved by certified Institutions to earn one credit. The certificate(Hindi) must be obtained from **Dakshina Bharat Hindi Prachar Sabha** and He/ she has to enroll and complete during their programme period (**first to fifth semester**)
- Student can opt for Type writing /short hand course to earn one extra credit. He/she has to enroll and complete the course during their programme period to obtain certificate through **Tamil Nadu Board of Technical Education**
- Student can opt for Diploma/certificate/CA/ACS/CMA foundation to earn one extra credit. Student who opt for Diploma/ Certificate course have to enroll any diploma/certificate course offered by Bharathiar University through our Institution. Student who opt for CA/ ACS/CMA have to enroll and complete the foundation level during the programme period.
- Award Winners in Academic/ Representation in Sports /Social Activities/ Extra Curricular/ Co-Curricular Activities at University/ District/ State/ National/ International level can earn one extra credit.

Programme Outcomes

On the successful completion of the programme, the following are the expected outcomes

PO Number	PO Statement
PO1	Gain knowledge in the observation, chemical techniques, experimental skills and scientific investigation.
PO2	Have an insight in all the aspects of chemistry and to build a solid foundation in the subject.
PO3	Improve lifestyle through the transforming power of chemistry.
PO4	Inspire the students to adopt scientific techniques and temper and line with scientific values.
PO5	Determine the scope of chemistry and perceive unique areas for further study.

17UTL11T	தமிழ் - தாள் -1	SEMESTER - I
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Total Credits: 3
Hours per Week: 5

குறிக்கோள்:

- மொழிப்பாடங்களின் வாயிலாக தமிழரின் பண்பாடு , பகுத்தறிவு, கலை மற்றும் மரபு ஆகியவற்றை அறிந்து மாணவர்களின் படைப்பாக்கத்திறன்களை ஊக்குவித்தல்

பயனடைவுக்கல்வியின் விளைவாக ஏற்படும் பயன்பாடுகள்:

பாடத்திட்டப் பகுப்பு முறை	பாடத்திட்டத்தின் குறிக்கோள்	அறிவுத்திறன் வெளிப்படும் அளவு முறை
CO1	வாழ்க்கைத் திறன்கள் (Life Skills) - மாணவனின் செயலாக்கத்திறனைத் தாய்மொழி வாயிலாக ஊக்குவித்தல்	K1, K2, K 3
CO2	மதிப்புக்கல்வி (Attitude and Value educations)	K2, K 4
CO3	பாட இணைச்செயல்பாடுகள் (Co-curricular activities)	K2, K3, K4
CO4	சூழலியல் ஆக்கம் (Ecology)	K4
CO5	மொழி அறிவு (Tamil knowledge)	K5, K6

Mapping with Programme outcomes

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	S	M	M	M	M
CO2	S	M	M	M	M
CO3	S	M	M	M	M
CO4	S	M	M	M	M
CO5	S	M	M	M	M

S - Strong,

M - Medium,

L - Low

17UTL11T	தமிழ் - தாள் -1	SEMESTER - I
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Total Credits: 3
Hours per Week: 5

கவிதை – சிறுகதை – இலக்கிய வரலாறு – இலக்கணம்

அலகு 1-கவிதைகள் - நாட்டுப்பற்று

- 1 பாரததேசம் . – பாரதியார்
- .2புத்தகசாலை,புதிய உலகு செய்வோம்- பாரதிதாசன்
- .3ஒற்றுமையே உயிர்நிலை – கவிமணி
- .4அவனும் அவளும் நாமக்கல் கவிஞர் –

அலகு –சமூகமும் 2, இயற்கையும்

- .1ஒப்பில்லாத சமுதாயம்அப்துல் – ரகுமான்
- .2காகிதப்பூக்கள் காமராசன்.நா -
- .3கரிக்கிறது தாய்ப்பால்- ஆரூர் தமிழ்நாடன்
- .4மரங்கள்- மு மேத்தா.
- .5ஹைகூ கவிதைகள் 10)கவிதைகள்(

அலகு – பெண்ணியம் 3

1. தற்காத்தல் – பொன்மணி வைரமுத்து
2. மாங்கல்ய மரமும் தொட்டில் மரமும் – ஆண்டாள் பிரியாதர்சினி
3. அம்மா – செல்வநாயகி
4. நீரில் அலையும் முகம் வெண்ணிலா.அ -

அலகு 4 -சிறுகதைகள்

1. பொன்னகரம் புதுமைப்பித்தன் –
2. விடியுமா? – கு.ரா.ப.
3. குருபீடம் – ஜெயகாந்தன்
4. காய்ச்சமரம் ராஜநாராயணன்.கி –
5. புதியபாலம் – நா பார்த்தசாரதி .
6. பூ –.....மேலாண்மை பொன்னுசாமி
7. வேட்கை- சூர்யகாந்தன்

அலகு 5 -இலக்கிய வரலாறு , இலக்கணம்

- .1தமிழ்க் கவிதையின் தோற்றமும் வளர்ச்சியும் மரபு),புதுக்கவிதைகள்(
- .2தமிழ்ச் சிறுகதையின் தோற்றமும் வளர்ச்சியும்
- .3வல்லினம் மிகும், மிகா இடங்கள்
- .4ர,ற ; ல, ழ, ள ; ண, ந,ன, வேறுபாடு

பார்வை நூல்கள்:

- .1செய்யுள் திரட்டு – தமிழ்த்துறை வெளியீடு
- .2இலக்கிய வரலாறு பேராசிரியர் முனைவர் பாக்கியமேரி -

17UHL11H	HINDI-I	SEMESTER - I
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Total Credits: 3**Hours per Week: 5****Preamble:**

- To develop the writing ability and develop reading skill.
- To learn various concepts and techniques for criticizing literature, to learn the techniques for expansion of ideas and translation process.

Course Outcomes:

On the successful completion of the course, students will be able to

CO Number	CO Statements	Knowledge Level
CO1	Learn the fundamentals of novels and stories	K1
CO2	Understand the principles of translation work	K2
CO3	Apply the knowledge writing critical views on fiction	K3
CO4	Build creative ability	K3
CO5	Expose the power of creative reading	K2

Mapping with Programme Outcomes

COS/POS	PO1	PO2	PO3	PO4	PO5
CO1	S	M	M	M	S
CO2	S	M	M	M	S
CO3	S	M	S	M	S
CO4	S	M	S	M	S
CO5	S	M	S	M	S

S - Strong,

M - Medium,

L - Low

17UHL11H	HINDI-I	SEMESTER - I
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Total Credits: 3
Hours per Week: 5

CONTENTS

UNIT - I

गद्य – नूतन गद्य संग्रह (जय प्रकाश)
 पाठ 1- रजिया
 पाठ 2- मक्रील
 पाठ 3- बहता पानी निर्मला
 पाठ 4- राष्ट्रपिता महात्मा गाँधी
 प्रकाशक: सुमित्र प्रकाशन
 204 लीला अपार्टमेंट्स, 15 हेस्टिंग्स रोड
 अशोक नगर इलाहाबाद-211001

UNIT - II

कहानी कुंज- डॉ. वी.पी. 'अमिताभ' (पाठ 1-4)
 प्रकाशक: गोविन्द प्रकाशन
 सदर बाजार, मथुरा
 उत्तर प्रदेश-281001

UNIT - III

व्याकरण : शब्द विचार (संज्ञा, सर्वनाम, कारक, विशेषण)
 पुस्तक: व्याकरण प्रदिप – रामदेव
 प्रकाशक: हिन्दी भवन 36
 टेगोर नगर
 इलाहाबाद-211024

UNIT - IV

अनुवाद अभ्यास-III (केवल अंग्रेजी से हिन्दी में)
 (पाठ 1 to 10)
 प्रकाशक: दक्षिण भारत प्रचार सभा चेन्नई -17

17UML11M	MALAYALAM-I	SEMESTER-I
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Total Credits: 3
Hours per Week: 5

Preamble:

- To develop the writing ability and develop reading skill.
- To learn various concepts and techniques for criticizing literature, to learn the techniques for expansion of ideas and translation process.

Course Outcomes:

On the successful completion of the course, students will be able to

CO Number	CO Statements	Knowledge Level
CO1	Learn the fundamentals of novels and stories	K1
CO2	Understand the principles of translation work	K2
CO3	Apply the knowledge writing critical views on fiction	K3
CO4	Build creative ability	K3
CO5	Expose the power of creative reading	K2

Mapping with Programme Outcomes

COS/POS	PO1	PO2	PO3	PO4	PO5
CO1	S	M	M	M	S
CO2	S	M	M	M	S
CO3	S	M	S	M	S
CO4	S	M	S	M	S
CO5	S	M	S	M	S

S – Strong,

M – Medium,

L – Low

17UML11M	MALAYALAM-I	SEMESTER-I
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Total Credits: 3
Hours per Week: 5

CONTENTS

Paper I Prose, Composition & Translation

This paper will have the following five units:

- 1. UNIT I & II** - Novel
- 2. UNIT III & IV** - Short story
- 3. UNIT V** - Composition & Translation

TEXT BOOKS:

1. Unit I & II -Naalukettu – M.T. Vasudevan Nair (D.C. Books, Kottayam, Kerala)
2. Unit III & IV - Manikkianum Mattu Prathana Kathakalum – Lalithampika Antharjanam (D.C.Books, Kottayam, Kerala)
3. Unit V- Expansion of ideas, General Essay and Translation of a simple passage from English about **100** words) to Malayalam

REFERENCE BOOKS:

1. Kavitha Sahithya Charitram –Dr. M.Leelavathi (Kerala Sahithya Academy, Trichur)
2. Malayala Novel sahithya Charitram –K.M.Tharakan(N.B.S. Kottayam)
3. Malayala Nataka Sahithya Charitram-G.Sankarapillai(D.C.Books, Kottayam)
4. Cherukatha Innale Innu –M.Achuyuthan(D.C. Books, Kottayam)
5. Sahithya Charitram Prasthanangalilude-Dr. K.M. George,(Chief Editor) (D.C. Books, Kottayam)

17UFL11F	FRENCH- I	SEMESTER- I
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Total Credit: 3
Hours per Week: 5

Preamble

- To Acquire Competence in General Communication Skills – Oral + Written – Comprehension & Expression
- To Introduce the Culture, life style and the civilization aspects of the French people as well as of France
- To help the students to acquire Competency in translating simple French sentences into English and vice versa

Course Outcomes:

On the successful completion of the course, students will be able to

CO Number	CO Statements	Knowledge Level
CO1	Learn the Basic verbs, numbers and accents	K1
CO2	To learn the adjectives and the classroom environment in France	K2
CO3	Learn the Plural, Articles and the Hobbies	K3
CO4	To learn the Cultural Activity in France	K3
CO5	To learn the Sentiments, life style of the French people and the usage of the conditional tense	K2

Mapping with Programme Outcomes

COS/POS	PO1	PO2	PO3	PO4	PO5
CO1	S	M	M	M	S
CO2	S	M	M	M	S
CO3	S	M	S	M	S
CO4	S	M	S	M	S
CO5	S	M	S	M	S

S – Strong,

M – Medium,

L – Low

17UFL11F	FRENCH- I	SEMESTER- I
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Total Credit: 3
Hours per Week: 5

Compétence Culturelle	Compétence De communication	Compétence grammaticale
UNITÉ 1 - Ici, en France		
<ul style="list-style-type: none"> • Moi et les Autres • La France Express 	<ul style="list-style-type: none"> • INTERACTION: s'identifier • RÉCEPTION ECRITE: Comprendre une annonce d'aéroport • RÉCEPTION ORALE: comprendre l'écrit de la rue (Panneaux, plaques, rues...) • PRODUCTION ÉCRITE: écrire un SMS 	<ul style="list-style-type: none"> • Le présent des verbes: Je suis, je reste, J'arrive • Le lieu: (je suis) à... (je suis) ici • L'infinitif
UNITÉ 2 - Ici, en classe		
<ul style="list-style-type: none"> • Moi et le français • Le français dans le monde 	<ul style="list-style-type: none"> • INTERACTION: Se présenter • RÉCEPTION ORALE: Comprendre des consignes Orales • RÉCEPTION ÉCRITE: Comprendre une fiche D'inscription • PRODUCTION ÉCRITE: écrire un texte à l'impératif 	<ul style="list-style-type: none"> • Tu/vous • Le présent des Verbes en-er et de être: je, tu, vous • La forme Impérative (tu, vous) Des verbes en-er
UNITÉ 3 - Samedi		

<ul style="list-style-type: none"> • Le fil du temps 	<ul style="list-style-type: none"> • INTERACTION: S'informer • RÉCEPTION ORALE: Comprendre une annonce • RÉCEPTION ÉCRITE: Comprendre un article (titres et illustrations) • PRODUCTION ÉCRITE: écrire des slogans 	<ul style="list-style-type: none"> • Les articles Défines:le,la,les • A,de+le,la,les: Au,aux,du,des,à l', de l' • Être(présent)l'heure • Ll faut+nom Ll faut+infinitive • Phrases verbe+complément, Complément+verbe
UNITÉ 4 - Dimanche		
<ul style="list-style-type: none"> • Les activités Culturelles des Français 	<ul style="list-style-type: none"> • INTERACTION: Acheter,demander des Informations • RECEPTION ORALE: Comprendre les Titres du journal à la radio • RÉCEPTION ÉCRITE: Comprendre les Informations • PRODUCTION ÉCRITE: Inventer des noms de journaux 	<ul style="list-style-type: none"> • Faire, present • Avior, present • Ll y a • Le présent des verbes en-er: Regarder • Combien? • Quand? • Complément de nom: Tremblement de terre, les noms de pays.... • Du,des,de la(reprise U2) • Les adjectifs possessifs: Mon,ta,son, Ma,ta,sa Mes,tes,ses

UNITÉ 5 - Dommage!		
<ul style="list-style-type: none"> • Un baby-boom en 2000 et 2001 • L'amour, toujours 	<ul style="list-style-type: none"> • INTERACTION: exprimer la tristesse, la peur, conseiller,encourager • RÉCEPTION ORALE: Comprendre une émission De radio • RÉCEPTION ÉCRITE: Comprendre un sondage • PRODUCTION ÉCRITE: écrire des blogs 	<ul style="list-style-type: none"> • Est-ce que • Le present des verbes pouvoir,Vouloir • Le conditionnel des Verbs pouvoir, Vouloir • Ne...pas

TEXT BOOK:

1. *Marcella Di Giura Jean-Claude Beacco, Alors I.* Goyal Publishers Pvt Ltd
86,University Block Jawahar Nagar (Kamla Nagar),New Delhi – 110007.

18UEG12G	English -I	SEMESTER - I
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Total Credits: 3
Hours per Week: 5

PREAMBLE:

To learn and teach English in a more relevant way through ecological issues and focus on environmental issues, a current problem that affects all lives.

On successful completion of the course, students will be able to

COURSE OUTCOME

CO No.	CO Statement	Knowledge Level
CO1	Identify the impact of nature on human lives	K3
CO2	Experiment with ecofriendly ambience through technical advancements	K3
CO3	Analyze and expose contemporary ecological issues	K4
CO4	Analyze the situational conversations created based on ecological factors	K4
CO5	Improve grammar and related reading of ecological issues	K6

MAPPING WITH PROGRAMME OUTCOME

COS/POS	PO1	PO2	PO3	PO4	PO5
CO1	M	M	S	S	S
CO2	S	S	S	S	S
CO3	S	S	S	S	S
CO4	S	S	S	S	S
CO5	S	S	S	M	M

S - Strong,

M - Medium,

L - Low

18UEG12G	English -I	SEMESTER - I
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Total Credits: 3
Hours per Week: 5

CONTENTS

UNIT I - POETRY

To Nature – S. T. Coleridge

Sonnet 18 - Shall I Compare Thee To a Summer day? – W. Shakespeare

Stopping by Woods on a Snowy Evening – Robert Frost

UNIT II -PROSE

The Discovery of Radium – Eve Curie

The Bihar Earthquake – Jawaharlal Nehru

The Amazon Ants – F.W. Up de Graff

UNIT III - SHORT STORY

The Sound Machine – Roald Dahl

The Lamp at Noon - Sinclair Ross

The Last Leaf – O. Henry

UNIT IV - ONE ACT PLAY

Moonshine – Arthur Hopkins

UNIT V - FUNCTIONAL GRAMMAR AND COMPOSITION

Sentences

Verbs – tenses and Voice

Concord

Letter Writing

Dialogue Writing

TEXT BOOK:

1. Eco English

REFERENCE BOOKS:

1. Shakespeare, William. *Shakespeare's Sonnets*. Ed. Stephen Booth. New Haven: Yale University Press, 1977. Print.
2. Krishnaswamy. N., *Modern English: A Book of Grammar Usage and Composition*. Chennai: Macmillan, 1975. Print.
3. Collocott. T.C., *New Radiant Readers Book X*. Chennai: Allied Pvt. Ltd, 2015. Print.
4. Dohl, Roald. *The Sound Machine*. UK: Penguin, 2012. Print.
5. Hopkins, Arthur. *Moonshine*. Los Angles: Hard press, 2012. Print.

18UCY13A	CORE I: GENERAL CHEMISTRY - I	SEMESTER - I
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Preamble

- Enable the students to understand the basic concepts in qualitative inorganic analysis, bonding in molecules, electron displacement effects, hybridization, polar effects and their importance.
- Gain knowledge in wave mechanical approach of an atom, thermodynamics concepts and thermo chemistry.

Course Outcomes

In the successful completion of the course, students will be able to

CO Number	Course Outcome Statement	Knowledge Level
CO1	Gain knowledge in the basics of chemistry and techniques for experimentation as well as proper use of chemicals and equipments. Design a demonstration that provides students with an opportunity to observe and take part in laboratory safety concerns necessary to prevent accidents. Interpret and identify the interfering ions in inorganic qualitative analysis	K1,K2,K3
CO2	To understand the basic concepts of bondings in molecules and to evaluate their bonding characteristics.	K1, K2, K3
CO3	To study about the aromatic nature of benzene compounds. To understand the polar effects of organic compounds.	K1, K2, K3
CO4	Compare and correlate the theories of gas laws. To learn the fundamentals of quantum mechanics and their approach to particles.	K1, K2, K3
CO5	To understand the basic terminologies in thermodynamics and to identify the nature of heat reactions.	K1, K2, K3

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	S	S
CO2	M	S	S	S	S
CO3	S	S	S	S	S
CO4	M	M	S	S	S
CO5	M	M	S	S	S

S – Strong,

M – Medium,

L – Low

18UCY13A	CORE I: GENERAL CHEMISTRY - I	SEMESTER - I
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Credits: 5**Hours per Week: 7****UNIT - I****Qualitative analysis**

Introduction - Dry reactions - heating, flame tests; Wet reactions - test tubes, centrifuge tubes, stirring rods, droppers, reagent bottles, centrifugation, washing the precipitates, wash bottles, transferring of precipitates, heating of solutions, evaporation, dissolving of precipitates, precipitation with hydrogen sulphide, cleaning of apparatus. Interfering anions and its elimination- Classification of cations into analytical groups (group separation only).

UNIT- II**Chemical Bonding**

Ionic bonding- Factors influencing the formation of ionic bond. Ionic crystals NaCl, CsCl. Lattice energy of ionic crystals - Born-Lande equation, Born-Haber cycle. Polarization of ions - Fajans rule.

Covalent bonding - Valence shell electron pair repulsion theory (VSEPR) to NH_3 , H_2O , ClF_3 , SF_4 . Valence bond theory, Types of overlap of atomic orbitals, Hybridization- examples for sp , sp^2 , sp^3 , sp^3d .

Co-ordinate covalent bond- Formation of hydronium ion. Comparison between ionic, covalent and coordinate bonding.

Hydrogen bonding-Types with examples. Bond strength, bond energy, bond angle and bond order.

Unit - III**Benzene and Aromaticity**

Structure of Benzene - isomer number, Kekule structure, resonance structure of benzene, orbital picture, stability of benzene ring, aromatic character - Huckel's rule.

Non-benzenoid aromatic compounds- cyclopropenyl cation, cyclopentadienyl cation and anion, 14- annulene.

Polar effects

Inductive effect, comparing acid strengths – Halogen substituted acids. Basicity of amines RNH_2 , R_2NH , R_3N and aniline. Mesomeric effect ($-\text{CN}$, CO). Resonance effect- conditions for resonance, resonance energy calculation. Hyper conjugation- Baker Nathan effect, hyper conjugative structures of toluene, ethylbenzene and iso-propylbenzene, Stability of primary, secondary and tertiary free radicals and primary, secondary and tertiary carbonium ions. Steric effect-examples and effect on reactivity.

Unit - IV**Gaseous state**

Derivation of gas laws from kinetic theory of gases, Gay-Lussac's law, Charles law, Boyle's law, Dalton's law of partial pressure. Maxwell Boltzmann distribution of molecular velocities (derivation not needed). RMS, MP and Average velocities- Kinetic energy from Maxwell Boltzmann law-Problems.

Quantum mechanics

de-Broglie equation, Heisenberg's uncertainty principle, Compton effect, Photoelectric effect, Schrodinger wave equation (Derivation).

Unit - V**Thermodynamics**

Definition- System, surroundings, isolated system, open system and closed systems, extensive and intensive properties, Types of process. First law of thermodynamics-Internal energy, internal energy and first law. State function and path function, exact and inexact differentials, enthalpy of system, enthalpy of vaporization, enthalpy of fusion, heat capacity of a system, relation between C_p and C_v in gaseous system. Joule Thomson effect, Joule Thomson coefficient and inversion temperature.

Thermo chemistry

Heat of neutralization, heat of solution, heat of combustion, Kirchoff's equation- Flame and explosion temperature, Bomb calorimeter- measuring enthalpy of combustion, Hess's law- Bond energy- calculations of bond energy.

TEXT BOOKS

1. G. Svehla, B. Sivasankar, **Vogel's Qualitative Inorganic Analysis**, Pearson, 7th Edition, 2012.
2. R. D. Madan, **Modern Inorganic Chemistry**, S.Chand and Co., Third Revised Edition, 2011.
3. M.K. Jain. S.C. Sharma, **Modern Organic Chemistry**, Vishal publishing Co., New Delhi, 2012 .
4. B.R. Puri, L.R. Sharma, M.S. Pathania, **Principles of Physical chemistry**, Vishal Publications, 2012.
5. B. R. Puri, L. R. Sharma, K. C. Kalia, **Principles of Inorganic Chemistry**, Vishal Publishing & Co., New Delhi, 2016.

REFERENCE BOOKS

1. J. D. Lee, **Concise Inorganic Chemistry**, Black Well Science, UK, 2006.
2. R.T. Morrison, R.N. Boyd, **Organic chemistry**, Pearson Prentice Hall, 2012.
3. S. Glasstone, D. Lewis, **Elements of Physical Chemistry**, Macmillan Ltd, London, 2004.

17UPY1AA	ALLIED PAPER I: PHYSICS-I	SEMESTER - I
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PREAMBLE

To enable students to learn and apply the basic principles, theory and concepts of Mechanics, Heat and Sound.

COURSE OUTCOMES

On the successful completion of the course, students will able to demonstrate

CO Number	CO Statement	Knowledge Level
CO1	Basic understanding of Gravitation and Elasticity and principles underlining them.	K2
CO2	Applications of Heat, Thermodynamics and Acoustics.	K3
CO3	Understanding of Solar energy and its industrial applications.	K2
CO4	Comparing and understanding principles involved in Electricity and Magnetism.	K2
CO5	Applications of Nano and Smart materials.	K3

MAPPING WITH PROGRAMME OUTCOMES

COs/ POs	PO1	PO2	PO3	PO4	PO5
CO1	S	M	S	M	S
CO2	M	S	S	M	S
CO3	S	S	S	M	M
CO4	S	S	S	S	S
CO5	M	S	S	M	S

S-Strong,

M-Medium,

L-Low

17UPY1AA	ALLIED PAPER I: PHYSICS-I	SEMESTER - I
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Credits: 3
Hours per Week: 4

UNIT- I

Gravitation: Newton's law of Gravitation-Determination of G by Boy's method-mass and density of earth - acceleration due to gravity-Determination of g by compound pendulum.

Elasticity: Basic concepts - bending of beams - depression of cantilever-Determination of Y by uniform and non- uniform bending method- Torsion in a wire- Determination of rigidity modulus by torsional pendulum.

UNIT II

Heat and thermodynamics : Vanderwaal's equation of state-critical constants of a gas-derivation of critical constants in terms of Vanderwaal's constants - Joule - Thomson - effect - Theory of J-K effect - properties of liquid Helium I and II.

Sound: Doppler effect - applications - determination of frequency of alternating current by Sonometer - Ultrasonics - production, properties and applications

UNIT III

Solar Physics: Solar constant - measurement of solar radiations by Pyroheliometer and Pyranometer - general applications of solar energy - flat-plate collector - box type cooker - solar water heaters - solar photo - voltaic cells - general applications of solar cells.

UNIT IV

Electricity: Conversion of Galvanometer into Ammeter and voltmeter – figure of merit of a galvanometer – Ballistic Galvanometer.

Magnetism: Basic concepts of magnetic materials – magnetic properties of Dia, Para and Ferro magnetic materials – Area of (B-H) loop – Curie temperature – applications of magnetic materials.

UNIT V

Nano materials: Introduction-Nano technology-preparation techniques-properties of Nano materials- Application of Nano materials.

Smart materials: Metallic glasses - Shapememory alloys-Biomaterials- Non-Linear optical materials-Applications.

BOOKS FOR STUDY:

1. *Brij Lal and Subrahmanyam N.* 2003. **Properties of Matter**, S. Chand and Co, New Delhi.
2. *G. D. Rai* Fourth Edition reprint 2003. **Non -Conventional energy Sources** - Khanna Publication.
3. *Brijlal and Subrahmanyam* 2004. **Heat and Thermodynamics**, S.Chand & Co., New Delhi
4. *N. Subramanian and Brijlal N* (2005). **A Text Book of Sound**, S. Chand & Co, New Delhi
5. *Brijlal and Subramanian* (2005). **Electricity and Magnetism**, S. Chand & Co.,
6. *R. Murugesan* (2005). **Electricity and Magnetism**, S. Chand & Co.,
7. *Dieter Vollath*, **Nanomaterials: An Introduction to Synthesis, Properties and Applications**, 2nd Edition

REFERENCE BOOKS:

1. *R. Murugesan* (2005). **Properties of matters**, Chand & Co.,
2. *Sukhatme* (2008). **Solar Energy Utilization**, Tata McGraw-Hill Education.
3. *D. S. Mathur* (2004). **Heat and Thermodynamics**, Chand & Co, Newdelhi.
4. *R. L. Saighal* (2005). **A Text Book of Sound**, S. Chand & Co.,
5. *D. N. Vasudeva* (2005). **Electricity and Magnetism-** S. Chand & Co.,
6. *S.Muthukumaran, Balaji* (2014).**Engineering Physics -II**, Sri Krishna hi-tech Publishing company.

17UFC1FA	VALUE EDUCATION- ENVIRONMENTAL STUDIES	SEMESTER - I
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Total Credits: 2
Hours per Week: 2

CONTENTS

UNIT- I

The Multi Disciplinary Nature of Environmental Studies: Definition, scope and importance-Need for public awareness-Natural resources-Natural resources and associated problems-Role of an individual in conservation of natural resources-Equitable use of resources for sustainable lifestyle...

UNIT- II

Eco System: Concept of an eco system-structure and function of eco system- Producers, consumers and decomposers-Energy flow in the eco system- Ecological succession-Food chain, food webs and ecological pyramids-Forest ecosystem-Grassland eco system-Desert eco system-Aquatic eco system...

UNIT- III

Bio Diversity and its Conservation Introduction Definition: Genetic, Species and Eco System Diversity-Bio Geographical Classification Of India: Value of bio diversity: conceptive use, productive use, social, ethical and option values-bio diversity at global, national and local levels-India as a mega diversity nation, hot spots-threats: habitat loss, poaching of wild life-man wild life conflicts-endangered and endemic species of India, conservation of bio diversity....

UNIT- IV

Environmental Pollution: Definition-causes, effects and control measures of air, water, soil, noise, thermal pollution-soil waste management: causes, effects and control measures of urban and industrial wastes-prevention of pollution-pollution case studies-disaster management: floods, earthquake, cyclone and landslides...

UNIT- V

Social Issues and the Environment: Sustainable development-urban problems related to energy-water conservation, rain water harvesting, watershed management-resettlement and rehabilitation of people ;its problems and concerns-environmental ethics: issues and possible solutions-climate change, global warming, ozone layer, depletion, acid rain, nuclear accidents and holo caust-consumerism and waste products-environmental protection act-air, water act-wild life protection act-forest conservation act-issues involved in enforcement of environmental legislation-public awareness-human population and the environment.

TEXT BOOK:

1. *Kumaraswamy. K, A. Alagappa Moses and M. Vasanthy. 2001, Environmental Studies.* Thanjavur- National Offset Printers.

17UTL21T	தமிழ் - தாள் - 2	SEMESTER - II
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Total Credits: 3
Hours per Week: 5

குறிக்கோள்:

- மொழிப்பாடங்களின் வாயிலாக தமிழரின் பண்பாடு , பகுத்தறிவு, கலை மற்றும் மரபு ஆகியவற்றை அறிந்து மாணவர்களின் படைப்பாக்கத்திறன்களை ஊக்குவித்தல்

பயனடைவுக்கல்வியின் விளைவாக ஏற்படும் பயன்பாடுகள்:

பாடத்திட்டப் பகுப்பு முறை	பாடத்திட்டத்தின் குறிக்கோள்	அறிவுத்திறன் வெளிப்படும் அளவு முறை
CO ₁	வாழ்க்கைத் திறன்கள் (Life Skills) - மாணவனின் செயலாக்கத்திறனைத் தாய்மொழி வாயிலாக ஊக்குவித்தல்	K ₁ , K ₂ , K ₃
CO ₂	மதிப்புக்கல்வி (Attitude and Value educations)	K ₂ , K ₄
CO ₃	பாட இணைச்செயல்பாடுகள் (Co-curricular activities)	K ₂ , K ₃ , K ₄
CO ₄	சூழலியல் ஆக்கம் (Ecology)	K ₄
CO ₅	மொழி அறிவு (Tamil knowledge)	K ₅ , K ₆

Mapping with Programme outcomes

COs /POs	PO1	PO2	PO3	PO4	PO5
CO1	S	M	M	M	M
CO2	S	M	M	M	M
CO3	S	M	M	M	M
CO4	S	M	M	M	M
CO5	S	M	M	M	M

S – Strong,

M – Medium,

L – Low

17UTL21T	தமிழ் 2- தாள் -	SEMESTER - II
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Total Credits: 3
Hours per Week: 5

செய்யுள் – உரைநடை – இலக்கிய வரலாறும் இலக்கணமும்

அலகு – 1

.1திருக்குறள் -அ(83 எண்.அ) கூடா நட்பு .

ஆ (93 எண்.அ) கள்ளுண்ணாமை.

இ (110 எண்.அ) குறிப்பறிதல் .

ஈ (113 எண்.அ) காதல் சிறப்புரைத்தல் .

.2மூதுரை 10) ஓளவையார்-பாடல்கள்6 -,7,9,10,14,16,17,23,26,30(

அலகு – 2

.1புரட்சிக்கவி -பாரதிதாசன்

அலகு – உரைநடை 3

1. சங்க நெறிகள் மாணிக்கம்.சுப.வ -
2. கர்ணனும் கும்பகர்ணனும் சேதுப்பிள்ளை.பி.ரா -
3. அறிவியலும் கலையும்வரதராசன்.மு -

அலகு – உரைநடை 4

1. வாழ்வியல் இயக்கம் – குன்றக்குடி அடிகளார்
2. பெரியார் உணர்த்தும் சுயமரியாதையும் சமதர்மமும் ஆனைமுத்து.வே -
3. போதைப்பொருள் – அமுதன்

அலகு 5 -இலக்கிய வரலாறும் இலக்கணமும்(பாடத்திட்டம் தழுவியது)

1. பதினெண்கீழ்க்கணக்கு நூல்கள்
2. தமிழ் உரைநடையின் தோற்றமும் வளர்ச்சியும்
3. வழி, வழுவமைதி,வழாநிலை
4. பிறமொழிச் சொற்களைத் தமிழில் மொழிபெயர்த்தல்

பார்வை நூல்கள்:

.1செய்யுள் திரட்டு – தமிழ்த்துறை வெளியீடு

.2இலக்கிய வரலாறு பேராசிரியர் முனைவர் பாக்கியமேரி -

17UHL21H	HINDI-II	SEMESTER - II
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Total Credits: 3
Hours per Week: 5

Preamble:

- To develop the writing ability and develop reading skill.
- To learn various concepts and techniques for criticizing literature, to learn the techniques for expansion of ideas and translation process.

Course Outcomes:

On the successful completion of the course, students will be able to

CO Number	CO Statements	Knowledge Level
CO1	Learn the fundamentals of novels and stories	K1
CO2	Understand the principles of translation work	K2
CO3	Apply the knowledge writing critical views on fiction	K3
CO4	Build creative ability	K3
CO5	Expose the power of creative reading	K2

Mapping with Programme Outcomes

COS/POS	PO1	PO2	PO3	PO4	PO5
CO1	S	M	M	M	S
CO2	S	M	M	M	S
CO3	S	M	S	M	S
CO4	S	M	S	M	S
CO5	S	M	S	M	S

S – Strong,

M – Medium,

L – Low

17UHL21H	HINDI-II	SEMESTER - II
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Total Credits: 3
Hours per Week: 5

CONTENTS

UNIT - I

आधुनिक पद्य – शबरी (श्री नरेश मेहता)

प्रकाशक: लोकभारती प्रकाशन

पहली मंजिल, दरबारी बिल्डिंग,

महात्मा गाँधी मार्ग, इलाहाबाद-211001

UNIT - II

उपन्यास : सेवासदन-प्रेमचन्द

प्रकाशक: सुमित्र प्रकाशन

204 लीला अपार्टमेंट्स, 15 हेस्टिंग्स रोड

अशोक नगर इलाहाबाद-211001

UNIT - III

अनुवाद अभ्यास-III (केवल हिन्दी से अंग्रेजी में)

(पाठ 1 to 10)

प्रकाशक: दक्षिण भारत प्रचार सभा चेन्नई -17

UNIT - IV

पत्र लेखन: (औपचारिक या अनौपचारिक)

17UML21M	MALAYALAM-II	SEMESTER-II
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Total Credits: 3
Hours per Week: 5

Preamble:

- To develop the writing ability and develop reading skill.
- To learn various concepts and techniques for criticizing literature, to learn the techniques for expansion of ideas and translation process.

Course Outcomes:

On the successful completion of the course, students will be able to

CO Number	CO Statements	Knowledge Level
CO1	Learn the fundamentals of novels and stories	K1
CO2	Understand the principles of translation work	K2
CO3	Apply the knowledge writing critical views on fiction	K3
CO4	Build creative ability	K3
CO5	Expose the power of creative reading	K2

Mapping with Programme Outcomes

COS/POS	PO1	PO2	PO3	PO4	PO5
CO1	S	M	M	M	S
CO2	S	M	M	M	S
CO3	S	M	S	M	S
CO4	S	M	S	M	S
CO5	S	M	S	M	S

S – Strong,

M – Medium,

L - Low

17UML21M	MALAYALAM-II	SEMESTER- II
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Total Credit: 3
Hours per Week: 5

PAPER II PROSE: NON-FICTION

This Paper will have the following five units:

UNIT I & II

Biography

UNIT III, IV & V

Travelogue

TEXT BOOKS:

1. Unit III, IV & V Kappirikalude Nattil – S.K. Pottakkadu (D.C. Books, Kottayam)
2. Kannerum Kinavum – V.T. Bhatathirippadu Autobiography (D.C. Books, Kottayam)

REFERENCE BOOKS:

1. **Jeevacharitrasahithyam** – Dr. K.M. George(N.B.S. Kottayam)
2. **Jeevacharitrasahithyam Malayalathil** - Dr. Naduvattom Gopalakrishnan (Kerala Bhasha Institute, Trivandrum)
3. **Athmakathasahithyam Malayalathil** – Dr. Vijayalam Jayakumar (N.B.S. Kottayam)
4. **Sancharasahithyam Malayalathil** - Prof. Ramesh Chandran. V, (Kerala Bhasha Institute, Trivandrum)

17UFL21F	FRENCH- II	SEMESTER- II
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Total Credit: 3
Hours per Week: 5

Preamble

- To Acquire Competence in General Communication Skills – Oral + Written – Comprehension & Expression
- To Introduce the Culture, life style and the civilization aspects of the French people as well as of France
- To help the students to acquire Competency in translating simple French sentences into English and vice versa

Course Outcomes:

On the successful completion of the course, students will be able to

CO Number	CO Statements	Knowledge Level
CO1	Learn the Basic verbs, numbers and accents	K1
CO2	To learn the adjectives and the classroom environment in France	K2
CO3	Learn the Plural, Articles and the Hobbies	K3
CO4	To learn the Cultural Activity in France	K3
CO5	To learn the Sentiments, life style of the French people and the usage of the conditional tense	K2

Mapping with Programme Outcomes

COS/POS	PO1	PO2	PO3	PO4	PO5
CO1	S	M	M	M	S
CO2	S	M	M	M	S
CO3	S	M	S	M	S
CO4	S	M	S	M	S
CO5	S	M	S	M	S

S – Strong,

M – Medium,

L - Low

17UFL21F	FRENCH-II	SEMESTER- II
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Total Credit: 3
Hours per Week: 5

Compétence Culturelle	Compétence De communication	Compétence grammaticale
UNITÉ 1 - Super!		
<ul style="list-style-type: none"> • L'égalité homme/femme 	<ul style="list-style-type: none"> • INTERACTION: Exprimer des sentiments, exprimer la joie, le plaisir, le bonheur • RÉCEPTION ORALE: Comprendre un jeu radiophonique • RÉCEPTION ÉCRITE: Comprendre des annonces • PRODUCTION ÉCRITE: Écrire des cartes postales 	<ul style="list-style-type: none"> • Les noms de professions masculine/feminine • Le verbe finir et les Verbes du groupe en-ir • Le present de l'impératif • Savoir(present) • Le participe passé: Fini, aimé, arrive, dit,écrit • Quel(s), quelle(s)..: Interrogatifet Exclamatif • À + infinitive • Les articles: n,une,des
UNITÉ 2 - Quoi?		
<ul style="list-style-type: none"> • Le 20 siècle: Petits progrès Grand progrès 	<ul style="list-style-type: none"> • INTERACTION: Decrire quelque chose, une personne • RECEPTION ORALE: Comprendre un message publicitaire • RÉCEPTION ÉCRITE: Comprendre un 	<ul style="list-style-type: none"> • On • Plus, moins • Le verbe aller: • Present, impératif • Aller + infinitive • Le pluriel en -x

	dépliant touristique <ul style="list-style-type: none"> • PRODUCTION ÉCRITE: Écrire des petites annonces 	
UNITÉ 3 - Et après		
<ul style="list-style-type: none"> • Nouvelles du jour 	<ul style="list-style-type: none"> • INTERACTION: Raconteur, situer un récit dans le temps • RÉCEPTION ORALE: Comprendre une description • RÉCEPTION ÉCRITE: Comprendre un test • PRODUCTION ÉCRITE: écrire des cartes postales 	<ul style="list-style-type: none"> • L'imparfait:: quel-Ques forms pour introduire le récit: Il faisait, il y avait, il Était • Un peu, beaucoup, trop, Assez • Très • Le verbe venir: Présent, impératif • En Suisse, au Maroc, aux Etats-Unis
UNITÉ 4- Mais oui!		
<ul style="list-style-type: none"> • La génération des 20-30 ans 	<ul style="list-style-type: none"> • INTERACTION: Donner son opinion, Expliquer pourquoi • RÉCEPTION ORALE: Comprendre des informations à la radio • RÉCEPTION ÉCRITE: Comprendre un texte informatif • PRODUCTION ÉCRITE: éncrire un mél de protestation 	<ul style="list-style-type: none"> • Répondre, prendre: Présent, impératif, part Passé • Parce que pourquoi • Tout/ tous, toute/s Tous/ toutes les... (répétition action)
UNITÉ 5- Mais non!		
<ul style="list-style-type: none"> • De la ville à la campagne 	<ul style="list-style-type: none"> • INTERACTION: Débat:: exprimer l'accord, exprimer le Désaccord • RECEPTION ORALE: 	<ul style="list-style-type: none"> • Le verbe devoir: Present et participe passé • Le verbe vivre, present • Aller + infinitive

	<p>Comprendre un message sur un répondeur téléphonique</p> <ul style="list-style-type: none"> • RÉCEPTION ÉCRITE: Comprendre un témoignage • PRODUCTION ECRITE: Rediger des petites Announces immobilières 	<ul style="list-style-type: none"> • Venir+ infinitive • Etre pour/contre
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TEXT BOOK:

1. *Marcella Di Giura Jean-Claude Beacco, **Alors I.*** Goyal Publishers Pvt Ltd 86, University Block Jawahar Nagar (Kamla Nagar) New Delhi - 110007

18UEG22G	English – II	SEMESTER - II
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Total Credits: 3
Hours per Week: 5

PREAMBLE:

To learn and teach English in a more relevant way through ecological issues and to focus on environment issues, a current problem that affect all lives.

COURSE OUTCOMES:

On successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Take part in improving the eco system through eco literature	K 4
CO2	Apply conventional and new methods of learning speech and vocabulary	K 3
CO3	Analyze contemporary situation through current ecological issues	K 4
CO4	Interpret the situational Conversations created based on ecological factors	K 2
CO5	Develop spelling, punctuation, Grammar and related reading	K 3

MAPPING WITH PROGRAMME OUTCOME

COS/POS	PO1	PO2	PO3	PO4	PO5
CO1	M	S	S	S	M
CO2	S	S	S	S	S
CO3	S	S	S	S	S
CO4	S	S	S	S	S
CO5	M	S	S	S	M

S – Strong,

M – Medium,

L – Low

18UEG22G	English – II	SEMESTER – II
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Total Credits: 3
Hours per Week: 5

CONTENTS

UNIT I – POETRY

Nature The Gentlest Mother is – Emily Dickinson

To Autumn – John Keats

The Boat – Rabindranath Tagore

UNIT II –PROSE

Literature and Science – John Middleton Murry

Ecology – Barry Commoner

Town by the Sea – Amitav Ghosh

UNIT III – SHORT STORY

How the Camel Got His Hump – Rudyard Kipling

A Day in the Country – Anton Chekhov

The tale of Peter Rabbit – Beatrix Potter

UNIT IV – ONE ACT PLAY

Riders to the sea – J. M. Synge

UNIT V – FUNCTIONAL GRAMMAR AND COMPOSITION

Relative Pronoun

Degrees of Comparison

Reported speech

Correction of Sentences

Picture Composition

TEXT BOOK:

1. Eco English

REFERENCE BOOKS:

1. Synge J.M., *Riders to the Sea*. Delhi: Unique, 2014. Print.
2. Ross, Sinclair. *The Lamp at Noon*, Toronto: Mc Clelland and Stewart, 1968. Print.
3. Ghosh, Amitav. *The Town by the Sea*. India: Penguin, 2017. Print.
4. Faulkner, Julia. *Twelve Poems of Emily Dickinson*. Melbourne: Boston, 1820. Print.
5. Krishnaswamy. N., *Modern English: A Book of Grammar Usage and Composition*. Chennai: Macmillan, 1975. Print.

18UCY23A	CORE II: GENERAL CHEMISTRY - II	SEMESTER - II
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Preamble

- Learn about the chemistry of s and p block elements and noble gases.
- Understand the basic concepts about aromaticity and electrophilic substitution reaction of benzene, mechanism of nucleophilic substitution reaction, structure of crystals and their properties, importance of Second law of thermodynamics.

Course Outcomes

In the successful completion of the course, students will be able to

CO Number	Course Outcome Statement	Knowledge Level
CO1	Identifying position of the elements in the periodic table and their properties. Comparison between the periodic behavior of elements and their properties.	K1,K2, K3
CO2	Understanding the properties and characteristics of s and p block elements. To study the anomalous properties existing between the elements.	K1,K2,K3
CO3	Study on the properties of aromatic compounds and their reactions. To gain knowledge on the conformations of cycloalkanes.	K2, K3
CO4	Broadening the concepts of organic reactions by comparing the reaction mechanisms.	K1, K2, K3
CO5	To know the limitations of first law of thermodynamics and to explore the need for second law of thermodynamics.	K2, K3

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	S	S
CO2	M	S	S	S	S
CO3	S	S	S	S	S
CO4	M	M	S	S	S
CO5	M	M	S	S	S

S – Strong,

M – Medium,

L – Low

18UCY23A	CORE II: GENERAL CHEMISTRY - II	SEMESTER - II
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Credits: 5**Hours per Week: : 7****Unit - I****Periodic properties:**

Long form periodic table- Causes of periodicity- division of elements into s, p, d and f blocks- Atomic properties- covalent radius, ionic radius- vanderwaals radius- periodic trends in ionic radii and covalent radii- periodic properties- ionization energy, electron affinity, electronegativity-factors influencing periodic properties- variation of periodic properties along groups and periods.

Unit - II**s & p block elements**

s-block elements-Position of alkali metals and alkaline earth metals in the periodic table and their general characteristics- Electronic configuration, physical state, atomic volume, ionic radii, density, ionization energy, electropositive character, reducing properties and oxidation state.

p-block elements - Anomalous behaviour of Li and diagonal relation between Li & Mg. Position of group III-A elements in the periodic table and general characteristics. Anomalous properties of B and diagonal relationship between B & Si. Chemistry of noble gases- Chemical properties of Noble gases, Chemistry of Xenon, Structure and bonding in Xenon compounds – XeF_2 , XeF_4 , XeF_6 , XeOF_4 , XeO_3 ,

Unit - III

Aromatic electrophilic substitution- nitration, sulphonation, halogenation, Friedel craft's acylation and alkylation, Reactivity and orientation of monosubstituted benzene.

Cycloalkanes : Nomenclature of alkanes, preparation and chemical reaction of cycloalkanes, Conformation of ethane and cyclohexane, Baeyer's strain theory and its limitations.

Unit - IV**Alkyl and aryl halides**

Nomenclature, methods of preparation, chemical reaction, mechanism of nucleophilic substitution of alkyl halides, SN^2 , SN^1 reaction with energy profile diagram. Mechanism of elimination reactions of alkyl halides- E^1 , E^2 and Substitution Vs Elimination. Substitution and elimination reactions - Saytzeff rule, Methods of preparation of aryl halides.

Unit - V**Thermodynamics**

Second law of thermodynamics - Need for second law, different statements, Carnot cycle - Carnot theorem, entropy-definition, entropy changes in reversible and irreversible processes, entropy changes in isothermal expansion of an ideal gas, Entropy as a function of T and V, entropy as a function of T and P. Entropy of mixing of ideal gases, physical significance of entropy.

General conditions of equilibrium and spontaneity- Conditions of equilibrium and spontaneity under constraints, definition of A and G, physical significance of A and G, Temperature and pressure dependence of G, Maxwells relations., Gibbs – Helmholtz equation (Derivation).

TEXT BOOKS

1. R. D. Madan, **Modern Inorganic Chemistry**, S.Chand and Co., Third Revised Edition, 2011.
2. Arun Bahl, B. S. Bahl, **Advanced Organic Chemistry**, S.Chand and Co, New Delhi, Revised multicolor edition, 2015.
3. B.R. Puri, L.R. Sharma, M.S. Pathania, **Principles of Physical chemistry**, Vishal Publications, 2012.

REFERENCE BOOKS

1. Puri B.R, Sharma L.R, Kalia K.C, **Principles of Inorganic Chemistry**, Milestone publishers and Distributors, New Delhi, 2014.
2. R.T. Morrison, R.N. Boyd, **Organic chemistry**, Pearson Prentice Hall, 2012.

17UCY23P	CORE PRACTICAL I: INORGANIC QUALITATIVE ANALYSIS	SEMESTER - II
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Total credits: 4
Hours per Week: : 4

Analysis of a mixture containing two cations and two anions of which one will be an interfering ion.

Semi micro methods using the conventional scheme with hydrogen sulphide may be adopted.

CATIONS TO BE STUDIED: Lead, Copper, Bismuth, Cadmium, Iron, Aluminum, Zinc, Manganese, Cobalt, Nickel, Barium, Calcium, Strontium, Magnesium and Ammonium.

ANIONS TO BE STUDIED: Carbonate, Sulphate, Nitrate, Chloride, Bromide, Fluoride, Borate, Oxalate, and Phosphate.

REFERENCE BOOKS

1. Venkateswaran. V, Veeraswamy. R, Kulandaivelu. A. R, **Basic Principles of Practical Chemistry**, 2nd Edition, New Delhi, Sultan Chand and Sons, 1997.
2. G. Svehla, **Vogel's Qualitative Inorganic Analysis**, Orient Longman Ltd, Hyderabad, 1987.

17UPY2AA	ALLIED PAPER II: PHYSICS-II	SEMESTER - II
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PREAMBLE

To enable the students in order to learn the basic principles, theory and concepts of Nuclear Physics and Wave Mechanics. To acquire introductory knowledge in the field of Semiconductor and Laser Physics.

COURSE OUTCOMES

On the successful completion of the course, students will able to demonstrate

CO Number	CO Statement	Knowledge Level
CO1	Basic understanding of Photo electric effect and Wave Mechanics.	K2
CO2	Applications of Accelerators and understanding Elementary Physics.	K3
CO3	Understanding of basics of Laser Physics and Spectroscopy.	K2
CO4	Understanding Semiconductor Physics and their applications.	K2
CO5	Applications of Integrated Circuits and Digital Electronics.	K3

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	S	M	S	M	S
CO2	M	S	S	M	S
CO3	S	S	S	M	M
CO4	S	S	S	S	S
CO5	M	S	S	M	S

S-Strong,

M-Medium,

L-Low

17UPY2AA	ALLIED PAPER II: PHYSICS-II	SEMESTER - II
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Credits: 3

Hours per Week: 4

UNIT- I

Modern physics: Photo electric effect – Einstein's photo electric equation – verification of Einstein's photo electric equation by Millikan's experiment – photo electric cells – applications

Wave mechanics: De Broglie matter waves – calculation of De Broglie wave length – Experimental study of De Broglie matter wave by G.P.Thomson experiment.

UNIT- II

Nuclear physics : characteristics of nuclear forces – nuclear structure by liquid drop model – Binding energy – mass defect – particle accelerators – cyclotron and betatron – artificial transmutations by α – particles - nuclear Fission and nuclear Fusion (basic idea only) – elementary particles – Leptons, Mesons and Baryons

UNIT III

Laser physics: Purity of spectral lines – Coherence length and time – spontaneous and induced emissions – population inversion – meta stable state – conditions for laser actions – Ruby laser – Helium – neon laser – applications of lasers – Raman effect – Raman shift – stokes and anti stokes lines – Laser Raman Spectrometer.

UNIT IV

Semiconductor Physics: Volt – Ampere Characteristics of P-N junction Diode – Zener diode – applications of Zener diodes - Volt – Principles of LED and

LCD – Frequency Modulation and Amplitude modulation – basic principles of antennas – RADAR – Principle and applications.

UNIT V

Integrated Circuits and Digital Electronics: Introduction - Steps in fabrication of Monolithic IC's – General applications of IC's.

Digital Electronics: Number systems – conversion of binary into decimal – conversion of decimal to binary – binary addition and subtraction – Basic logic gates – NAND and NOR as an universal logic gates – Demorgan's theorems – Boolean algebra –applications of Demorgan's theorems.

BOOKS FOR STUDY:

1. R. Murugesan (2004), **Modern Physics**, S. Chand & Co.
2. M.N.Aravamudhan, **An Introduction to Laser Theory and application**, S.Chand & Co.
3. B.L. Theraja (2000).**Basic Electronics (Solid state)**, S. Chand & Co.,
4. Malvino & Leach, **Digital Principles and application**, Tata-McGraw Hill Publishers
5. V.K. Metha , **Principles of Electronics** , S. Chand & Co.,

BOOKS FOR REFERENCE

1. Gupta and Kumar ,**Handbook of Electronics**, S. Chand & Co.,
2. R.K. Gaur (1993), **Engineering Physics**, Dhanpat Rai & Sons.
3. Arumugam M(2010). *Engineering Physics*, Anuradha publishers.
4. Bartee (1985), **Digital Computer Fundamentals**, McGraw-Hill Education (India) Pvt Limited.

17UPY2AP	ALLIED PRACTICAL I: PHYSICS	SEMESTER-II
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Credits: 3**Hours per Week: 3****LIST OF EXPERIMENTS:****Any 12 Experiments**

1. Young's Modulus-Uniform Bending (Microscopic Method)
2. Young's Modulus-Non-uniform Bending (Microscopic Method)
3. Compound Pendulum – determination of 'g' and 'K'
4. Torsional Pendulum – Rigidity Modulus
5. Rigidity Modulus – Static Torsion
6. Spectrometer – Refractive Index of a glass Prism
7. Spectrometer – Grating- Minimum deviation & Normal Incidence
8. Moment of a Magnet – Tan C position
9. Viscosity – Poiseuille's Method
10. Meter Bridge- Temperature Coefficient of resistance
11. Meter Bridge- Specific Resistance of a material
12. Specific Heat capacity of a Liquid – Newton's method of cooling
13. Sonometer – Frequency of a tuning fork
14. Post office box- Determination of Temperature Coefficient of Resistance
15. Post office box- Determination of Specific Resistance

17UFC2FA	VALUE EDUCATION- HUMAN RIGHTS	SEMESTER - II
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Total Credits: 2
Hours per Week: 2

CONTENTS

UNIT- I

Concept of Human Values, Value Education Towards Personal Development

Aim of education and value education; Evolution of value oriented education; Concept of Human values; types of values; Components of value education.

Personal Development: Self analysis and introspection; sensitization towards gender equality, physically challenged, intellectually challenged. Respect to - age, experience, maturity, family members, neighbours, co-workers.

Character Formation towards Positive Personality: Truthfulness, Constructivity, Sacrifice, Sincerity, Self Control, Altruism, Tolerance, Scientific Vision.

UNIT - II

Value Education Towards National and Global Development

National and International Values: Constitutional or national values - Democracy, socialism, secularism, equality, justice, liberty, freedom and fraternity.

Social Values - Pity and probity, self control, universal brotherhood.

Professional Values - Knowledge thirst, sincerity in profession, regularity, punctuality and faith.

Religious Values - Tolerance, wisdom, character.

Aesthetic values - Love and appreciation of literature and fine arts and respect for the same.

National Integration and international understanding.

UNIT - III

Impact of Global Development on Ethics and Values: Conflict of cross-cultural influences, mass media, cross-border education, materialistic values, professional challenges and compromise.

Modern Challenges of Adolescent Emotions and behavior; Sex and spirituality: Comparison and competition; positive and negative thoughts.

Adolescent Emotions, arrogance, anger, sexual instability, selfishness, defiance.

UNIT - IV

Therapeutic Measures

Control of the mind through

- a. Simplified physical exercise
- b. Meditation – Objectives, types, effect on body, mind and soul
- c. Yoga – Objectives, Types, Asanas
- d. Activities:
 - (i) Moralisation of Desires
 - (ii) Neutralisation of Anger
 - (iii) Eradication of Worries
 - (iv) Benefits of Blessings

UNIT- V

Human Rights

1. Concept of Human Rights – Indian and International Perspectives
 - a. Evolution of Human Rights
 - b. Definitions under Indian and International documents
2. Broad classification of Human Rights and Relevant Constitutional Provisions.
 - a. Right to Life, Liberty and Dignity
 - b. Right to Equality
 - c. Right against Exploitation
 - d. Cultural and Educational Rights
 - e. Economic Rights
 - f. Political Rights
 - g. Social Rights

3. Human Rights of Women and Children
 - a. Social Practice and Constitutional Safeguards
 - (i) Female Foeticide and Infanticide
 - (ii) Physical assault and harassment
 - (iii) Domestic violence
 - (iv) Conditions of Working Women
4. Institutions for Implementation
 - a. Human Rights Commission
 - b. Judiciary
5. Violations and Redressal
 - a. Violation by State
 - b. Violation by Individuals
 - c. Nuclear Weapons and terrorism
 - d. Safeguards.

REFERENCE BOOKS:

1. Dey A. K, 2002, **Environmental Chemistry**. New Delhi – Vile Dasas Ltd.
2. Gawande . E.N. **Value Oriented Education**. Vision for better living. New Delhi, Saruptsons.
3. Brain Trust Aliyar, 2008, **Value Education for health, happiness and harmony**. Vethathiri publications, Erode.
4. Ignacimuthu S. J. S, 1999, **Values for life**. Bombay Better Yourself.
5. Seetharam. R. (Ed), 1998 , **Becoming a better Teacher** Madras Academic Staff College.
6. Grose. D. N , 2005, **A text book of Value Education**. Dominant Publishers and Distributors, New Delhi.
7. Shrimali K. L, 1974, **A Search for Values in Education**. Vikas Publishers, Delhi.
8. Yogesh Kumar Singh & Ruchika Nath , 2005, **Value Education**. P. H Publishing Corporation, New Delhi.
9. Venkataram & Sandhiya. N, 2001, **Research in Value Education**. APH

Publishing Corporation, New Delhi.

10. *Ruhela S. P.* **Human Value and Education.** Sterling publishers, New Delhi.
11. *Brain Trust Aliyar,* 2004, **Value Education for Health, Happiness and Harmony.** Vethathiri publications , Erode.
12. *Swami Vivekananda ,* 2008, **Personality Development.** Advaita Ashrama, Kolkata.
13. *Swami Jagadatmananda,* **Learn to Live.** Sri Ramakrishna Math, Chennai.

17UTL31T	CORE-PART I TAMIL	SEMESTER-3
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Total Credits: 3

Hours per Week: 4

குறிக்கோள்

மொழிப்பாடங்களின் வாயிலாக தமிழரின் பண்பாடு, பகுத்தறிவு, கலை மற்றும் மரபு ஆகியவற்றை அறிந்து மாணவர்களின் படைப்பாக்கத்திறன்களை ஊக்குவித்தல்

பயனடைவுக்கல்வியின் விளைவாக ஏற்படும் பயன்பாடுகள்

பாடத்திட்டப் பகுப்பு முறை	பாடத்திட்டத்தின் குறிக்கோள்	அறிவுத்திறன் வெளிப்படும் அளவு முறை
CO ₁	வாழ்க்கைத் திறன்கள் (Life Skills) - மாணவனின் செயலாக்கத்திறனைத் தாய்மொழி வாயிலாக ஊக்குவித்தல்	K ₁ , K ₂ , K ₃
CO ₂	மதிப்புக்கல்வி (Attitude and value educations).	K ₂ , K ₄
CO ₃	பாட இணைச்செயல்பாடுகள் (Co-curricular activities)	K ₂ , K ₃ , K ₄
CO ₄	சூழலியல் ஆக்கம் (ecology)	K ₄
CO ₅	மொழி அறிவு (tamil knowledge)	K ₅ , K ₆

K₁-Remembering, K₂-Understanding, K₃-Applying, K₄-Analysing, K₅-Evaluating, K₆-Creating

Mapping with Programme outcomes

COs/POs	PO 1	PO 2	PO 3	PO 4	PO 5
CO 1	S	M	M	M	M
CO 2	S	M	M	M	M
CO 3	S	M	M	M	M
CO 4	S	M	M	M	M
CO 5	S	M	M	M	M

S-Strong,

M-Medium,

L-Low

17UTL31T	தமிழ் தாள் - 3	SEMESTER - III
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Total Credits: 3
Hours per Week: 4

காப்பியம் – சிற்றிலக்கியம் – நாடகம் – இலக்கிய வரலாறு – இலக்கணம்

அலகு 1-காப்பியங்கள்

- .1சிலப்பதிகாரம் – மனையறம் படுத்த காதை
- .2மணிமேகலை – வஞ்சிமாநகர் புக்க காதை
- .3கம்பராமாயணம் – கும்பகர்ணன் வதைப்படலம் பா). எண் (100 – 60 :
- 4 . பெரிய புராணம் – அதிபத்தநாயனார் புராணம்

அலகு – சிற்றிலக்கியங்கள் 2

- .1முத்தொள்ளாயிரம் (சேரனைப்பற்றியது எண் .பா (:20 -1
- .2கலிங்கத்துப்பராணி – களம் பாடியது – போர்க்களக் காட்சி) பா(503 –472 :எண்.
- .3திருக்குற்றாலக்குறவஞ்சி – வசந்தவல்லி பந்தாடிய சிறப்பு 6):(கண்ணிகள்4

அலகு – நாடகம் 3

- .1குறிஞ்சிப்பாட்டு - இன்குலாப்

அலகு 4 -இலக்கிய வரலாறு

- .1காப்பியங்களின் தோற்றமும் வளர்ச்சியும்
- .2சிற்றிலக்கியத்தின் தோற்றமும் வளர்ச்சியும்
- .3நாடகத்தின் தோற்றமும் வளர்ச்சியும்

அலகு 5 -இலக்கணம்

- 1. 'பா' வகைகள் : வெண்பா, ஆசிரியப்பா, கலிப்பா, வஞ்சிப்பா - பொது இலக்கணம்

2 அணி . - உவமையணி, உருவக அணி, இல்பொருள் உவமையணி

.3அலுவலகம் சார்ந்த கடிதம் - விண்ணப்பங்கள், வேண்டுகோள், முறையீடு

பார்வை நூல்கள்:

.1 செய்யுள் திரட்டு தமிழ்த்துறை வெளியீடு -

.2 குறிஞ்சிப்பாட்டு - இன்குலாப் - அன்னம் வெளியீடு

.3 தமிழ் இலக்கிய வரலாறு பேராசிரியர் முனைவர் பாக்யமேரி -

17UHL31H	HINDI-III	SEMESTER - III
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Total Credits: 3
Hours per Week: 4

CONTENTS

UNIT - I

पद्य – काव्य पराशर (भोलानाथ)

(प्राचीन- कबीर, तुलसी, सुर, मीरा, आधुनिक- गुप्त, प्रसाद, पंत, निरारा,
दिनकर, अज्ञेय)

प्रकाशक: जवाहर पुस्तकालय

सदर बाजार, मथुरा

उत्तर प्रदेश-281001

UNIT - II

हिन्दी साहित्य का इतिहास : (केवल आदिकाल और भक्तिकाल - साधारण ज्ञान)

अलंकार: अनुप्रास, यमक, श्लेष, वक्रोक्ति, उपमा, रूपक

प्रकाशक: विनोद पुस्तक मंदिर

आगरा-282002

17UML31M	MALAYALAM-III	SEMESTER III
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Total Credits: 3
Hours per Week: 4

Preamble

- To develop the writing ability and develop reading skill.
- To learn various concepts and techniques for criticizing literature, to learn the techniques for expansion of ideas and translation process.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statements	Knowledge Level
CO1	Learn the fundamentals of novels and stories.	K1
CO2	Understand the principles of translation work.	K2
CO3	Apply the knowledge writing critical views on fiction.	K3
CO4	Build creative ability.	K3
CO5	Expose the power of creative reading.	K2

K1-Remembering K2- Understanding K3- Applying

Mapping with Programme Outcomes

COS/POS	PO1	PO2	PO3	PO4	PO5
CO1	S	M	M	M	S
CO2	S	M	M	M	S
CO3	S	M	S	M	S
CO4	S	M	S	M	S
CO5	S	M	S	M	S

S -Strong,

M- Medium,

L-Low

15UML31M	MALAYALAM-III	SEMESTER III
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Total Credits: 3
Hours per Week: 4

CONTENTS

PAPER III- POETRY

This Paper will have the following five units:

Unit I, II & III

A part of Ezuthachan's Work

Unit IV & V

A Khandakavya of Vallathol

Text Books prescribed:

Unit I, II & III

Karnnaparvam – Ezuthachan
(Poorna Publications, Calicut)

Unit IV & V

Achanum Makalum – Vallathol (D.C. Books, Kottayam)

17UFL31F	FRENCH-III	SEMESTER -III
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Total Credits: 3**Hours per Week: 4****Preamble**

- To Acquire Competence in General Communication Skills – Oral + Written – Comprehension & Expression.
- To Introduce the Culture, life style and the civilization aspects of the French people as well as of France.
- To help the students to acquire Competency in translating simple French sentences into English and vice versa.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statements	Knowledge Level
CO1	Learn the Basic verbs, numbers and accents.	K1
CO2	To learn the adjectives and the classroom environment in France.	K2
CO3	Learn the Plural, Articles and the Hobbies.	K3
CO4	To learn the Cultural Activity in France.	K3
CO5	To learn the Sentiments, life style of the French people and the usage of the conditional tense.	K2

K1-Remembering K2- Understanding K3- Applying**Mapping with Programme Outcomes**

COS/POS	PO1	PO2	PO3	PO4	PO5
CO1	S	M	M	M	S
CO2	S	M	M	M	S
CO3	S	M	S	M	S
CO4	S	M	S	M	S
CO5	S	M	S	M	S

S- Strong,

M-Medium,

L-Low,

17UFL31F	FRENCH-III	SEMESTER -III
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Total Credits: 3

Hours per Week: 4

CONTENTS

Compétence Culturelle	Compétence de Communication	Compétence Grammatical
UNITÉ 1- Excuses et vœux		
<ul style="list-style-type: none"> • Convivialité (lieux et société, l'apéritif) 	<ul style="list-style-type: none"> • INTERACTION ORALE: Accueillir quelqu'un, s'excuser, remercier • RÉCEPTION ORALE: Comprendre des annonces enregistrées • RÉCEPTION ÉCRITE: Comprendre une affiche • PRODUCTION ÉCRITE: Écrire des cartes de vœux 	<ul style="list-style-type: none"> • Pronoms personnels toniques <i>moi, je...; toi... tu</i> • Pronoms personnels objets <i>Me, te, le...</i> • Les verbes en -er comme appeler, acheter • Les adjectifs possessifs <i>nos, vos, leurs</i>
UNITÉ 2 – Bravo et merci		
<ul style="list-style-type: none"> • Communication et technologies (le portable, internet) 	<ul style="list-style-type: none"> • INTERACTION ORALE: Interagir au téléphone, féliciter • RÉCEPTION ORALE: Comprendre une émission à la radio • RÉCEPTION ORALE: Comprendre une définition • PRODUCTION ÉCRITE: Écrire des plaques commémoratives 	<ul style="list-style-type: none"> • Oui, que • Le passé composé • Le participe passé <i>J'ai eu, elle a été</i> • Longtemps, pendant ..., de... à
UNITÉ 3 – Faire et dire		
<ul style="list-style-type: none"> • Jeunes : enquête 	<ul style="list-style-type: none"> • INTERACTION ORALE: Demander de l'aide, donner des instructions • RÉCEPTION ORALE: Comprendre un message 	<ul style="list-style-type: none"> • Ce/cet, cette, ces • Le verbe voir • Envoyer, appuyer • Les articles partitifs <i>du, de la (de l)', des, de</i>

	enregistré • RÉCEPTION ÉCRITE : Comprendre un article d'un magazine de consommateurs • PRODUCTION ÉCRITE : Écrire un règlement	
UNITÉ 4 – Faire ci ou faire ça		
• Les vacances des Français	• INTERACTION ORALE : Proposer quelque chose, accepter, refuser • RÉCEPTION ORALE : Comprendre une émission de cuisine • RECEPTION ÉCRITE : Comprendre une brochure d'informations • PRODUCTION ÉCRITE : Ecrire un texte de promotion touristique	• <i>S'il y a du soleil :</i> L'hypothèse (supposition, Condition) la préposition <i>Si +</i> <i>indicatif</i> • <i>Sinon... ou + indicatif</i> • <i>Sortir, partir</i> • <i>Quelques, plusieurs</i> • <i>Le long de</i> • <i>Au milieu de...</i> • <i>Au sommet de...</i>
UNITÉ 5 – Cœur et santé		
• Author du Couple	• INTERACTION ORALE: Exprimer son intérêt pour quelqu'un, exprimer l'affection • RECEPTION ORALE: Comprendre une chanson • RECEPTION ÉCRITE: Lire un horoscope • PRODUCTION ÉCRITE: Écrire une lettre au courrier du cœur	• J'étais... L'imparfait(1) • Aussi brillant que... • Le plus beau, le moins cher • Le verbe connaître

TEXT BOOK:

1. *Marcella Di Giura Jean-Claude Beacco, Alors II* . Goyal Publishers Pvt Ltd 86, University Block ,Jawahar Nagar (Kamla Nagar), New Delhi – 110007.

17UEG32G	ENGLISH-III	SEMESTER - III
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Total Credits: 3
Hours per Week: 4

PREAMBLE:

To develop and enrich the language competencies of the students with the Functional English

COURSE OUTCOMES:

On successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Develop knowledge on behavioral pattern and morale through prose	K3
CO2	Extend focus on Ecology through poetry	K2
CO3	Educate on Illustrating the significance of Short Stories	K2
CO4	Build knowledge on One-Act plays	K3
CO5	Test for descriptive Functional Grammar	K4

MAPPING WITH PROGRAMME OUTCOME

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	S	M	M	S	S
CO2	S	S	M	M	S
CO3	S	S	M	S	S
CO4	M	S	S	S	S
CO5	M	S	M	S	S

S – Strong,

M – Medium,

L – Low

17UEG32G	ENGLISH- III	SEMESTER- III
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Total Credit: 3
Hours per Week: 4

CONTENTS

UNIT I -PROSE

1. Mobile and Mixed Up – Anil Dharker
2. Good Manners – J.C. Hill
3. Chasing Celebrities – R.K. Narayan

UNIT II - POETRY

1. The Stolen Boat – William Wordsworth
2. Money Madness – D.H. Lawrence
3. On Killing a Tree – Gieve Patel

UNIT III - SHORT STORIES

1. The Scorn - Bama
2. The Dying Detective – Sir Authur Canon Doyle
3. The Refugees – Pearl.S.Buck

UNIT IV - ONE ACT PLAY

1. Refund – Fritz Karinthy
2. Mother's Day – J.B. Priestley

UNIT V - FUNCTIONAL ENGLISH

1. Agenda, Minutes & Notice
2. Report Writing
3. Electronic Correspondence

TEXT BOOK:

1. Board of Editors, *Melody*. Department of English. Dr. N.G.P. Arts and Science College (Autonomous), Coimbatore.

REFERENCE BOOKS:

1. Syamala.V., *Effective English Communication for You.*, Emerald Publishers., Chennai.
2. N. Krishnaswamy., *Modern English: A Book of Grammar, Usage And Composition.*, Macmillan India Ltd-New Delhi.
3. Wren and Martin, *High School English Grammar and Composition*. S. Chand Publishing 2006, New Delhi.

17UCY33A	CORE III: GENERAL CHEMISTRY - III	SEMESTER - III
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PREAMBLE

- To know the basic concepts in quantitative as well as gravimetric analysis, some naming reactions involving carbonyl compounds, chemistry of dicarboxylic acids, phase rule and its applications.

COURSE OUTCOMES

In the successful completion of the course, students will be able to

CO Number	Course Outcome Statement	Knowledge Level
CO1	Gain knowledge in preparation and determine the strength of the solutions	K2, K3
CO2	To understand the knowledge of gravimetric analysis and their applications.	K2,K3
CO3	Study on the reaction of carbonyl compounds with different reagents.	K2
CO4	Study on preparation, properties and reactions of dicarboxylic acids, unsaturated acids and hydroxyl acids.	K3,K4
CO5	Analyze the thermal property of the system by applying phase rule.	K3,K4

MAPPING WITH PROGRAMME OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	S	S
CO2	S	S	M	S	M
CO3	S	S	S	S	S
CO4	S	M	S	M	S
CO5	M	S	S	S	S

S - Strong,

M - Medium,

L - Low

17UCY33A	CORE III: GENERAL CHEMISTRY - III	SEMESTER - III
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Credits: 5**Hours per Week: : 6****UNIT - I****Quantitative Analysis**

1. The mole concept – atomic, molecular and molar masses. Equivalent mass – Equivalent mass of an acid, equivalent mass of a base, equivalent mass of oxidizing and reducing agents.
2. Concentration terms – Normality, molarity, mole fraction, molality, percentage solution – weight composition, volume composition.
3. Principles of volumetric analysis – standard solution (primary and secondary standards) titration – types (acid, base, oxidation, reduction), equivalent point, end point, indicators – action of phenolphthalein and methyl orange, caution in volumetric titrimetry – precautions to avoid errors in titrimetric analysis, corrections for unavoidable errors.

UNIT - II**Gravimetric Analysis**

Precipitation methods, colloidal state, supersaturation and precipitate formation, purity of the precipitate – post precipitation, co-precipitation, conditions of precipitation, precipitation from homogeneous solution, washing the precipitate, Ignition of the precipitate – Thermogravimetric methods of analysis, quantitative separations based on precipitation methods- fractional precipitation, organic precipitants, volatilisation or evolution methods.

UNIT III

Aldehydes and ketones

Reactions of aldehydes and ketones, nucleophilic addition of Grignard reagent, Aldol condensation, mixed aldol condensation, Perkin, Knoevenagel, Claisen, Cannizaro, Reformatsky reactions. Reactions with LiAlH_4 and NaBH_4 -Wolf Kishner reduction.

UNIT IV

Dicarboxylic acids – Oxalic, Malic, Malonic, Succinic, Maleic acid, Fumaric acid, Adipic acid – Preparation and properties.

Unsaturated acid - Acrylic acid and Crotonic acid - Preparation and properties.

Hydroxy acids -Tartaric acid, Citric acid - Preparation and properties.

Dienes - Nomenclature and classification of dienes - Isolated, conjugated and cumulated dienes. Polymerization - 1,2 and 1,4 addition, Diels - Alder reaction.

UNIT V

Phase rule

Phase rule - Phase, degree of freedom. Phase equilibria - Condition for equilibrium, Derivation of Gibbs' phase rule. Phase equilibria in one component system - Sulphur, Water and Carbon dioxide systems. Phase diagrams for two component system – Construction and thermal analysis of phase diagrams of Pb-Ag, Bi-Cd and Na-K systems.

TEXT BOOKS

1. G. H. Jeffery, J. Bassett, **Vogel's Text book of Quantitative Chemical Analysis**, John Wiley & Sons, 5th Edition.
2. Arun Bahl, B. S. Bahl, **Advanced Organic Chemistry**, S.Chand and Co, New

Delhi, Revised multicolor edition, 2015.

3. *B.R. Puri, L.R. Sharma, M.S. Pathania, Principles of Physical chemistry*, Vishal Publications, 2012.

REFERENCE BOOKS

1. *J. D. Lee, Concise Inorganic Chemistry*, Black Well Science, UK, 2006.
2. *R.T. Morrison & R.N. Boyd, Organic chemistry*, Pearson Prentice Hall, 2012.
3. *B.S. Bahl & Arun Bahl, Essentials of Physical chemistry*, S. Chand & Co, 1st Edn.

17UCY3SA	SKILL BASED COURSE I: WATER CHEMISTRY	SEMESTER - III
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PREAMBLE

- To know about the sources and characteristics of water and to gain knowledge about the type of pollutants in water, the analysis of the pollutants in water, the methods of purification of water and about the water management

COURSE OUTCOMES

In the successful completion of the course, students will be able to

CO Number	Course Outcome Statement	Knowledge Level
CO1	To study about the sources and characteristics of water.	K1, K2
CO2	To gain knowledge in the aspects of pollution and their consequences. Identify the location of water pollution sources.	K2, K3
CO3	Examine the water quality by chemical and physical methods.	K3, K4
CO4	Applying the acquired knowledge, to determine the purification of water using various techniques.	K2, K3
CO5	To infer and solve the water management issues in various fields.	K2, K3

MAPPING WITH PROGRAMME OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	S	S
CO2	M	S	S	S	S
CO3	S	S	S	S	S
CO4	M	M	S	S	S
CO5	M	M	S	S	S

S – Strong;

M – Medium,

L – Low

17UCY3SA	SKILL BASED COURSE I: WATER CHEMISTRY	SEMESTER - III
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Credits: 3**Hours per Week: : 3****UNIT-I****Sources of water**

Introduction - uses of water - water for industry - Sources of water - Quality of natural waters -Chemistry of water - Water in human body - Water as a solvent - main quality characteristics of water - effects of water on rocks and minerals - organic matter in water - humic material in water - colloidal material in water - Environmental phosphorus chemistry.

UNIT-II**Water pollution**

Definition - water pollutants - types of water pollution - ground water pollution, surface water pollution, lake water pollution, river water pollution and sea water pollution - physical pollution of water - chemical pollution of water - biological pollution of water - physiological pollution of water.

UNIT- III**Analysis of a water pollutants**

Measurement of water quality by chemical and physical examination of water - Chemical substances affecting potability - electrical conductivity - suspended solids - dissolved solids - alkalinity - measurement of toxic chemical substances - general analytical methods of determination of metals - international standards for drinking water - dissolved oxygen - biochemical oxygen demand - chemical oxygen demand.

UNIT- IV**Purification of water**

Removal of coarse, dispersed and colloidal impurities from water - Coagulation of water - Contact and electrochemical coagulation - Flocculants - Sterilisation and disinfection of water - Chemical methods of sterilisation - Physical methods of sterilization. Desalination of brackish water - Reverse osmosis.

Zeolite process - Ion exchange method - Demineralization of water - Determination of hardness of water - EDTA method.

UNIT-V

Water management

Introduction - Water management - Use and conservation of water resources - Water quality management - Rain water harvesting - Water from rocks - Water management in agriculture - Rain fed system - Irrigated systems - Sea water for agriculture - Water management in industries.

TEXT BOOK

1. *B.K Sharma, Water pollution*, Goel publishing House, Meerut, 2003.

REFFRENCES

1. *Jain and Jain, Engineering Chemistry*, Dhanpat Rai Publishing Co., 1998.
2. *N. Manivasakam (Water Analyst), Chemical and Microbiological Analysis of Mineral Water and Packaged Drinking Water*, Principal Public Health Laboratory, Coimbatore, 2001.

17UMT3AB	ALLIED PAPER III: MATHEMATICS - I	SEMESTER - III
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PREAMBLE

1. On completion of this course the students should gain knowledge about solving equations, solving first and second order differential equations using Laplace transforms.

2. To know about the concept of Fourier series which will be useful in their field of study.

COURSE OUTCOMES

In the successful completion of the course, student will be able to

CO Number	CO Statement	Knowledge Level
CO 1	Learn about Polynomial Equations.	K1
CO 2	Learn the concept & Manipulation of Matrices	K1
CO 3	Apply trigonometric functions to solve problems.	K2
CO 4	Learn about standard form of Laplace Transforms	K2
CO 5	Application of Laplace Transform in solving Differential Equations	K3

MAPPING WITH PROGRAMME OUTCOMES

COS/POS	PO 1	PO 2	PO 3	PO 4	PO 5
CO 1	M	M	M	M	S
CO 2	M	M	M	S	S
CO 3	S	M	M	S	S
CO 4	M	S	M	S	M
CO 5	S	M	M	S	S

S- Strong,

M-Medium,

L-Low

17UMT3AB	ALLIED PAPER III: MATHEMATICS - I	SEMESTER - III
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Credits: 3
Hours per Week: 5

UNIT-I

Theory of Equations: Polynomial Equations with real coefficients : Imaginary and irrational roots - Transformation of equation by Diminishing or increasing its roots by a constant-Reciprocal Equation.

UNIT-II

Matrices: Eigen Values and eigen vectors, Cayley-Hamilton theorem (without proof) - Verification and computation of inverse.

UNIT-III

Trigonometry: Expansion of $\cos n\theta$ and $\sin n\theta$ in terms of powers of cosine and sine-Expansions of $\cos^n\theta$, $\sin^n\theta$ in powers of sine and cosine - hyperbolic functions.

UNIT-IV

Laplace Transforms: Definition-Standard forms of Laplace Transform - Linearity transformation- shift theorem-Transform of $tf(t), f(t)/t$.

UNIT-V

Inverse Laplace transforms: Inverse of standard functions -Application to solution of differential equations - Solving of simultaneous differential equation.

TEXT BOOK:

1. *Abdul Rasheed ,A. Allied Mathematics.* 2006.Tata McGraw-Hill Education (P) Ltd, Chennai.

REFERENCE BOOKS:

1. *Manichavasagam Pillai, T.K and Narayanan,S.* 2002. **Trigonometry.**
Viswanathan Publishers and Printers Pvt.Ltd.
2. *Narayan,S and Manicavachagam Pillai,T.K.* 2002. **Ancillary Mathematics.**
Viswanathan Publishers and Printers Pvt.Ltd.

17UNM34Y	NMEC-I: CHEMISTRY IN DAILY LIFE - I	SEMESTER - III
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PREAMBLE

- To learn about the chemistry involved in our daily life.

COURSE OUTCOMES

In the successful completion of the course, students will be able to

CO Number	Course Outcome Statement	Knowledge Level
CO1	Basic understanding of water technology and acquire knowledge in the treatment of water for multi-purpose.	K1, K3
CO2	Study on the manufacture of alcohol and alcoholic beverages.	K1,K2
CO3	To understand the chemistry involved in manufacture of fatty acids.	K2
CO4	To design a demonstration, that provides an opportunity to identify adulteration in food standards.	K2, K3
CO5	Broadening the knowledge about paints and pigments.	K3

MAPPING WITH PROGRAMME OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	S	S
CO2	M	S	S	S	S
CO3	S	S	S	M	S
CO4	M	S	M	S	S
CO5	M	M	S	S	S

S – Strong,

M – Medium,

L – Low

17UNM34Y	NMEC-I: CHEMISTRY IN DAILY LIFE - I	SEMESTER III
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Credits: 2
Hours per Week: : 2

Unit - I

Water Treatment

Introduction – Sources and Uses of Water – Water for Industrial Purposes – Quality of Normal water – water in human body – Hardness of water – Types -Softening of Water – Soda – Lime Process, Zeolite, and Ion-exchange Processes (principles only). Demineralization of water – Treatment of Water for Municipal purposes – Desalination of Brackish Water – Electro dialysis – Reverse Osmosis Method (principles only).

Unit - II

Fermentation

Introduction – Conditions for Fermentation – Characteristics of Enzymes – Fermentation Processes – Alcohol Beverages – Wine, Beer-Manufacture of Spirits – Whisky – Wine Vinegar – Manufacture – Manufacture of Power Alcohol – Alcohol from Molasses, Starch, Hydrocarbon gases – Uses.

Unit - III

Oils, Fats, Waxes and Soap

Waxes – Classification – Solubility – Saponification value –Manufacture of Candles – Hydrocarbon in Candles – Hydrogenation – of Oils – Soaps – Manufacture – detergents – Cleansing Action of Soaps.

Unit - IV

Food Adulteration and Hygiene

Definition of Adulteration of Food – Common Adulterants in Different Foods – Toxic Effects of Some Metals and Chemicals – Contamination of Foods with

Harmful Microorganisms – Detection of Adulteration in Some Common Food items – Food Additives and Preservatives – Food standards.

Unit – V

Paints

Classification – Requirements of a good paint -Importance of PVC – Paint Failure. Emulsion Paints , Enamels , Lacquers and Varnishes – constituents and Manufacture.

TEXT BOOKS

1. *P.C. Jain and Monika Jain, Engineering Chemistry, Dhanpat Rai & Sons, Delhi*
2. *B. Sri Lakshmi, Food Science, New Age, 5th ed. (2011).*

REFERENCES

1. *B.K. Sharma, Environmental Chemistry, Krishna Prakasam Medai (P) Ltd., Meerut, 6th Revised Edn., (2001).*
2. *M. Swaminathan, Food & Nutrition, Bappco, 2nd ed. (2011).*
3. *Jayashree, Applied Chemistry, S. Chand, 3rd ed. (2013).*

17UFC3FA	பகுதி : 4 – அடிப்படைத்தமிழ் தாள்1 : (Basic Tamil)	SEMESTER- III
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இளங்கலைஆம் கல்வியாண்டு முதல் சேர்வோர்க்குரியது 2018 – 2017

10)மற்றும் – 12 ஆம் வகுப்பு வரை தமிழ் மொழிப்பாடம் பயிலாதவர்களுக்கு
(பருவத் தேர்வு உண்டு)

அலகு .தமிழ் மொழியின் அடிப்படைக் கூறுகள் .1 :

அ) எழுத்துகள் :

- உயிர் எழுத்துக்கள் - குறில் , நெடில் எழுத்துகள்
- மெய் எழுத்துக்கள் - வல்லினம், மெல்லினம், இடையினம்
- உயிர்மெய் எழுத்துக்கள்

ஆ) சொற்களின் வகைகள் :பெயர்ச்சொல், வினைச்சொல் – விளக்கம் (எ.கா.)

அலகு குறிப்பு எழுதுதல் .2 :

- பெயர், முகவரி, பாடப்பிரிவு , கல்லூரியின் முகவரி
- தமிழ் மாதங்கள்(12), வாரநாட்கள்(7),
எண்கள் (ஒன்று முதல் பத்து வரை), வடிவங்கள், வண்ணங்கள்
- ஊர்வன, பறப்பன, விலங்குகள், மனிதர்களின்
உறவுப்பெயர்கள்
- இந்திய மாநிலங்கள், நதிகள், தேசத் தலைவர்கள் பற்றிய
குறிப்புகள்

வினாத்தாள் அமைப்பு முறை - மொத்த மதிப்பெண்கள் - 50			
பகுதி -அ	சரியான விடையைத் தேர்வு செய்தல்	10x2=20	அனைத்து அலகுகளில் இருந்தும் வினாக்கள் அமைதல் வேண்டும்
பகுதி -ஆ	அரைப்பக்க அளவில் விடையளிக்க	5x3=15	
பகுதி-இ	இரண்டு பக்க அளவில் விடையளிக்க	1x15=15	

17UFC3FB	பகுதி -2சிறப்புத் தமிழ் : தாள் :1 (Advanced Tamil)	SEMESTER- III
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இளங்கலைஆம் கல்வியாண்டு முதல் சேர்வோர்க்குரியது 2018 – 2017

)10 மற்றும் – 12 ஆம் வகுப்புகளில் தமிழ் மொழிப்பாடம் பயின்றவர்களுக்கு உரியது
(பருவத் தேர்வு உண்டு)

அலகு :1 –மரபுக் கவிதைகள்

அபாரதியார் கவிதைகள்(

- தமிழ்நாடு
- மனதில் உறுதி வேண்டும்
- வருகின்ற பாரதம் (பா.எண்.5-8)

ஆ)பாரதிதாசன் கவிதைகள்

- இன்பத்தமிழ்
- நீங்களே சொல்லுங்கள்
- உலக ஒற்றுமை
- வாளினை எட்டா!
-

அலகு – 2 : புதுக்கவிதைகள்

- கம்பன் கவியரங்கக் கவிதை - மு.மேத்தா
- தமிழா! நீ பேசுவது தமிழா! - காசியானந்தன்
- நட்புக் காலம் (10 கவிதைகள்) - அறிவுமதி கவிதைகள்

அலகு : 3 –இலக்கணம்

- வல்லினம் மிகும் மற்றும் மிகா இடங்கள்
- ர, ற, - ல, ழ, ள - ந, ண, ன - வேறுபாடு அறிதல்
-

அலகு :4 –கடிதங்கள் எழுதுதல்

- பாராட்டுக் கடிதம்
- நன்றிக் கடிதம்
- அழைப்புக் கடிதம்
- அலுவலக விண்ணப்பங்கள்
-

அலகு :5 –பாடம் தழுவிய வரலாறு

- பாரதியாரின் இலக்கியப் பணி
- பாரதிதாசனின் இலக்கியப்பணி
- மரபுக்கவிதை, புதுக்கவிதை - விளக்கம்

வினாத்தாள் அமைப்பு முறை - மொத்த மதிப்பெண்கள் - 50			
பகுதி -அ	சரியான விடையைத் தேர்வு செய்தல்	10x1=10	ஒவ்வொரு அலகிலும் இரண்டு வினாக்கள்
பகுதி -ஆ	அரைப்பக்க அளவில் விடையளிக்க	5x3=15	ஒவ்வொரு அலகிலும் ஒரு வினா
பகுதி -இ	இரண்டு பக்க அளவில் விடையளிக்க	5x5=25	ஒவ்வொரு அலகிலும் ஒரு வினா
குறிப்பு: பகுதி ஆ மற்றும் இ -க்கான வினாக்கள் இது அல்லது அது என்ற அடிப்படையில் அந்தந்த அலகுகளில் அமைதல் வேண்டும்			

17UFC3FC	YOGA FOR HUMAN EXCELLENCE	SEMESTER - III
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Total Credits: 2
Hours per Week: 2

CONTENTS

UNIT - I

Yoga and Physical Health

- 1.1 Physical Structure-Three bodies-Five limitations
- 1.2 Simplified physical Exercise - Hand Exercises - Leg Exercises - Breathing Exercises - Eye Exercises -Kapalapathi
- 1.3 Maharasanas 1-2 Massages - puncture-Relaxation
- 1.4 Yogasanas - Padmasana- Vajrasanas-Chakrasanas (side) - Viruchasanas -Yoga muthra - Patchimothasanas - Ustrasanas - Vakkarasanas - Salabasanas

UNIT - II

Art of Nurturing the life force and Mind

- 2.1 Maintaining the youthfulness -Postponing the ageing process
- 2.2 Sex and Spirituality - Significance of sexual vital fluid - Married life Chastity
- 2.3 Ten stages of Mind
- 2.4 Mental frequency - Methods for concentration

UNIT - III

Sublimation

- 3.1 Purpose and Philosophy of life
- 3.2 Introspection - Analysis of Thought
- 3.3 Moralization of Desires
- 3.4 Neutralization of Anger

UNIT IV

Human Resources Development

- 4.1 Eradication of worries
- 4.2 Benefits of Blessings
- 4.3 Greatness of Friendship
- 4.4 Individual Peace and World Peace

UNIT V

Law of Nature

- 5.1 Unified force – Cause and Effect system
- 5.2 Purity of Thought and Deed and Genetic Centre
- 5.3 Love and Compassion
- 5.4 Cultural Education – Fivefold Culture

17UFC3FD	WOMEN'S RIGHTS	SEMESTER - III
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Total Credits: 2
Hours per Week: 2

CONTENTS

UNIT- I

Laws, Legal Systems and Change: Definition - Constitutional law, CEDAW and International Human Rights - Laws and Norms - Laws and Social Context - Constitutional and Legal Framework.

UNIT- II

Politics Of Land And Gender In India: Introduction - Faces of Poverty - Land as Productive Resources - Locating Identities - Women's Claims to Land - Right to Property - Case Studies.

UNIT- III

Women's Rights: Access to Justice: Introduction - Criminal Law - Crime Against Women - Domestic Violence - Dowry Related Harassment and Dowry Deaths - Molestation - Sexual Abuse and Rape - Loopholes in Practice - Law Enforcement Agency.

UNIT- IV

Women's Rights: Violence Against Women - Domestic Violence - The Protection of Women from Domestic Violence Act, 2005 - The Marriage Validation Act, 1982 - The Hindu Widow Re-marriage Act, 1856 - The Dowry Prohibition Act, 1961.

UNIT -V

Special Women Welfare Laws: Sexual Harassment at Work Places - Rape and Indecent Representation - The Indecent Representation (Prohibition) Act, 1986 - Immoral Trafficking - The Immoral Traffic (Prevention) Act, 1956 - Acts Enacted for Women Development and Empowerment - Role of Rape Crisis Centers.

REFERENCES BOOKS:

1. *Nitya Rao*. 2008. **“Good Women do not Inherit Land”** Social Science Press and Orient Blackswan.
2. *International Solidarity Network* , 2006 ,**“Knowing Our Rights”** An imprint of Kali for Women.
3. *Kaushik. P.D.* 2007. **“Women Rights”** Bookwell Publication.
4. *Aruna Goal.* 2004. **“Violence Protective Measures for Women Development and Empowerment.”** Deep and Deep Publications Pvt.
5. *Monica Chawla.* 2006. **“Gender Justice”**. Deep and Deep Publications Pvt Ltd.
6. *Preeti Mishra.* 2007. **“Domestic Violence Against Women”**. Deep and Deep Publications Pvt.
7. *Clair M. Renzetti, Jeffrey L. Edleson, and Raquel Kennedy Bergen.* 2001. Source Book on **“Violence Against Women”**. Sage Publications.

17UFC3FE	CONSTITUTION OF INDIA	SEMESTER - III
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Total Credits: 2

Hours per Week: 2

CONTENTS

UNIT I

Making of Constitution - Constituent Assembly- Dr.RajendraPrasath-
Dr.B.R.Ambedkar - Salient features - Fundamental Rights.

UNIT II

Union Executive - President of India - Vice-President - Prime Minister
- Cabinet - Functions

UNIT III

Union Legislature - Rajiya Sabha - Lok Sabha - Functions and Powers

UNIT IV

Union Judiciary - Supreme Court - Functions - Rule of law

UNIT V

State - Executive - Legislature - Judiciary - Role of Tamilnadu
Public Service Commission.

REFERENCE BOOKS:

1. *Agharwal.R.C.* 1977, **National Moment and Constitutional Development.** New Delhi.
2. *Chapra B.R.,* 1970,**Constitution of India.** New Delhi.
3. *Rao B.V,* 1975. **Modern Indian Constitution.** Hyderabad.
4. *Nani Palkhivala ,*1970, **Constitution of India,** New Delhi.
5. *Krishna Iyer, V.R.,* 2009, **Law and Justice.** New Delhi.
6. Reference Manual from the Govt. of Tamilnadu

17UCYSS1	SELF STUDY PAPER: CHEMISTRY IN THE SERVICE OF MANKIND	SEMESTER - III
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PREAMBLE

- To gain knowledge about the techniques involved in the processing of commercial products.

COURSE OUTCOMES

In the successful completion of the course, students will be able to

CO Number	Course Outcome Statement	Knowledge Level
CO1	Know about renewable and non-renewable resources.	K1, K2
CO2	To study about natural and synthetic polymers. To know the needs and requirements of the fertilizers.	K1, K2 & K3
CO3	Broaden the knowledge in the sources and the functions of vitamins. To distinguish the properties of some important drugs.	K2, K3
CO4	To have an insight idea on the surface coatings and paints.	K2, K3
CO5	To acquire knowledge in the industrial preparation of paper, sugar, cement, glass.	K2, K3

MAPPING WITH PROGRAMME OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	S	M
CO2	M	S	M	S	S
CO3	S	S	S	M	M
CO4	S	M	S	S	S
CO5	S	S	M	S	S

S – Strong,

M – Medium,

L – Low

17UCYSS1	SELF STUDY PAPER: CHEMISTRY IN THE SERVICE OF MANKIND	SEMESTER - III
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Credits:1**Unit - I****Fuels and Energy Resources**

Types of fuels - liquid fuels - petroleum products - gaseous fuel - coal gas, producer gas and bio gas - Rocket fuels - solid and liquid propellants - nuclear fuels - difference between nuclear and chemical fuels. Renewable sources of energy - solar energy, wind energy and tidal energy.

Unit - II**Polymers and Fertilizers**

Chemistry of some important polymers - synthetic fibres - nylons, polyester - synthetic rubber - polyurethane rubber - reclaimed rubber - sponge, foam rubber, thermocol - polymerization techniques - bulk, solution, suspension, emulsion polymerization.

Plant nutrients - need and requirements - natural and artificial fertilizer - urea, triple super phosphate, muriate of potash - complex fertilizers.

Unit - III**Vitamins and Drugs**

Vitamins - Water soluble vitamins - Vitamin B and C - fat soluble vitamins - A, D, E & K -sources - physiological functions and deficiency symptoms.

Drugs - some important drugs - antibacterials - sulphonamide - antipyretics - aspirin - antimalarials - paludrine - antibiotics - penicillin.

Unit - IV**Surface Coatings**

Pretreatment of the surface metallic coating, galvanizing, tinning, inorganic coatings, organic coatings, oil paints, water paints, special paints, enamels and lacquers.

Unit - V

Industrial Processes

Small scale units - manufacture of candles, safety matches, soap and naphthalene balls, shoe polish, gum paste, fountain pen ink, Chalk crayons, plaster of paris and silicon carbide crucibles.

Large scale units - manufacture of pulp and paper, sugar, glass, ceramics and cement.

TEXT BOOK

1. *B.K. Sharma, **Industrial Chemistry**, Goel Publishing House, 12th Edition, 2001.*

REFERENCES

1. *P.C. Jain and Monica Jain, **Engineering Chemistry**, Dhanpat Rai and Sons, 15th edition 2006.*
2. *George and T Austin, **Shreve's Chemical Process Industries**, McGraw Hill Book Co, 1984.*

17UCYSS2	SELF STUDY PAPER: COSMETIC CHEMISTRY	SEMESTER -III
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PREAMBLE

- To know about the major constituents and the chemistry involved in beauty care products.

COURSE OUTCOMES

In the successful completion of the course, students will be able to

CO Number	Course Outcome Statement	Knowledge Level
CO1	To know about the chemical constituents and composition of hair care products.	K1, K2
CO2	To identify and differentiate the skincare products according to their constituents.	K2, K3
CO3	To understand the manufacturing methods involved in colour cosmetics.	K1, K2
CO4	To know about the dental products and their importance.	K1, K2, K3
CO5	Understand the constituents and manufacturing methods of bath powders.	K1, K2, K3

MAPPING WITH PROGRAMME OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5
CO1	S	M	M	S	S
CO2	M	S	S	M	S
CO3	S	S	M	S	M
CO4	S	M	S	S	S
CO5	M	S	S	M	S

S - Strong,

M - Medium,

L - Low

Credits:1

17UCYSS2	SELF STUDY PAPER: COSMETIC CHEMISTRY	SEMESTER -III
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Unit - I**Hair Care Products**

Shampoos – principal constituents – thickeners and foam stabilizers – perfumes – preservatives – conditioning agents – antidandruff shampoos.

Hair cream – composition – hair dyes – types – constituents – dye removals

Unit - II**Skin Care Product**

Skin cleansers – classifications – cold cream – cleansy milk – moisturizers – hand and body lotions – sun screen lotions – constituents

Unit - III**Colour Cosmetics**

Lipstick – constituents – manufacturing method – lip glosses – nail polish – formulation – manufacture – face powder – constituents.

Unit - IV - Dental Product

Oral care product – product categories – toothpaste – toothpowder – oral rinses – mouth washes.

Unit - V - Bath Powder Preparation

Bath powders – soap and detergents – constituents – manufacture.

TEXT BOOK

1. **Modern Technology of Cosmetics**, Asia Pacific Business Press Inc., New Delhi, 2004.

REFERENCE

1. B.K. Sharma, **Industrial Chemistry**, Goel Publishing House, 12th Edition, 2001.

17UTL41T	தமிழ் தாள் - 4	SEMESTER - IV
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Total Credits: 3
Hours Per Week: 4

குறிக்கோள்:

- மொழிப்பாடங்களின் வாயிலாக தமிழரின் பண்பாடு, பகுத்தறிவு, கலை மற்றும் மரபு ஆகியவற்றை அறிந்து மாணவர்களின் படைப்பாக்கத்திறன்களை ஊக்குவித்தல்
 பயனடைவுக்கல்வியின் விளைவாக ஏற்படும் பயன்பாடுகள்:

பாடத்திட்டப் பகுப்பு முறை	பாடத்திட்டத்தின் குறிக்கோள்	அறிவுத்திறன் வெளிப்படும் அளவு முறை
CO1	வாழ்க்கைத் திறன்கள் (Life Skills) - மாணவனின் செயலாக்கத்திறனைத் தாய்மொழி வாயிலாக ஊக்குவித்தல்	K 1, K 2, K 3
CO2	மதிப்புக்கல்வி (Attitude and Value educations)	K 2, K 4
CO3	பாட இணைச்செயல்பாடுகள் (Co-curricular activities)	K 2, K 3, K 4
CO4	சூழலியல் ஆக்கம் (Ecology)	K 4
CO5	மொழி அறிவு (Tamil knowledge)	K5, K6

Mapping with Programme Outcome

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	S	M	M	M	M
CO2	S	M	M	M	M
CO3	S	M	M	M	M
CO4	S	M	M	M	M
CO5	S	M	M	M	M

S - Strong, M - Medium, L - Low

17UTL41T	தமிழ் தாள் - 4	SEMESTER - IV
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Total Credits: 3
Hours Per Week: 4

சங்க இலக்கியம் - நாட்டுப்புற இலக்கியம்- இலக்கிய வரலாறு - இலக்கணம்

அலகு - 1 எட்டுத்தொகை

1. குறுந்தொகை - (நெய்தல் , பாடல் எண் : 57 - சிறைக்குடி ஆந்தையார்)
(மருதம் , பாடல் எண்: 61 - தும்பிசேர்கீரன்)
(முல்லை , பாடல் எண்: 167 - கூடலூர்கிழார்)
2. கலித்தொகை - (பாலைக்கலி , பாடல் எண் :17 - பெருங்கடுங்கோ)
3. அகநானூறு - (பாலை , பாடல் எண் : 43 - நல்லந்துவனார்)
4. புறநானூறு - (பா.எண்.192 - கணியன் பூங்குன்றனார், பா.எண் : 279 -
ஒக்கூர் மாசாத்தியார் , பா.எண்: 312 - பொன்முடியார்)

அலகு - 2 பத்துப்பாட்டு

1. முல்லைப்பாட்டு - நப்பூதனார்

அலகு - 3 நாட்டுப்புறவியல்

1. நாட்டுப்புறப்பாடல்கள் - அறிமுகம்
2. தாலாட்டுப் பாடல்கள் (2 பாடல்கள்)
3. தொழில் பாடல்கள் (1 பாடல்கள்)
4. ஆத்தங்கரை ஓரம் (புதினம்) - வெ.இறையன்பு

அலகு - 4 இலக்கிய வரலாறு

1. எட்டுத்தொகை
2. பத்துப்பாட்டு
3. புதினத்தின் தோற்றமும் வளர்ச்சியும்

அலகு - 5 இலக்கணம்

1. அகத்திணை - விளக்கம்
2. புறத்திணை - விளக்கம் (12 திணைகள்)

பார்வை நூல்கள்

1. தமிழ்த்துறை வெளியீடு
2. இலக்கிய வரலாறு - பேராசிரியர் முனைவர் பாக்கியமேரி
3. நாட்டுப்புற இயல் ஆய்வு - சு. சக்திவேல்

17UHL41H	HINDI-IV	SEMESTER - IV
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Total Credits: 3
Hours Per Week: 4

Preamble:

- To develop the writing ability and develop reading skill.
- To learn various concepts and techniques for criticizing literature, to learn the techniques for expansion of ideas and translation process.

Course Outcomes:

On the successful completion of the course, students will be able to

CO Number	CO Statements	Knowledge Level
CO1	Learn the fundamentals of novels and stories.	K1
CO2	Understand the principles of translation work.	K2
CO3	Apply the knowledge writing critical views on fiction.	K3
CO4	Build creative ability.	K3
CO5	Expose the power of creative reading.	K2

Mapping with Programme Outcomes

COS/POS	PO1	PO2	PO3	PO4	PO5
CO1	S	M	M	M	S
CO2	S	M	M	M	S
CO3	S	M	S	M	S
CO4	S	M	S	M	S
CO5	S	M	S	M	S

S – Strong, M – Medium, L – Low

17UHL41H	HINDI-IV	SEMESTER - IV
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Total Credits: 3
Hours Per Week: 4

CONTENTS

UNIT - I

नाटक – लडाई – सर्वेश्वरदयाल सक्सेना

प्रकाशक: वाणी प्रकाशन

21-A, दरियागंज

नई दिल्ली-110002

UNIT - II

एकांकी : एकांकी पंचामृत – डॉ राम कुमार

(भोर और तारा छोड़कर)

प्रकाशक: जवाहर पुस्तकालय

सदर बाजार, मथुरा

उत्तर प्रदेश-281001

UNIT - III

साधारण निबंध

प्रकाशक: आदर्श निबंध

विनोद पुस्तक मंदिर

आगरा-282002

17UML41M	MALAYALAM-IV	SEMESTER- IV
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Total Credits: 3
Hours Per Week: 4

Preamble:

- To develop the writing ability and develop reading skill
- To learn various concepts and techniques for criticizing literature, to learn the techniques for expansion of ideas and translation process

Course Outcomes:

On the successful completion of the course, students will be able to

CO Number	CO Statements	Knowledge Level
CO1	Learn the fundamentals of novels and stories.	K1
CO2	Understand the principles of translation work.	K2
CO3	Apply the knowledge writing critical views on fiction.	K3
CO4	Build creative ability.	K3
CO5	Expose the power of creative reading.	K2

Mapping with Programme Outcomes

COS/POS	PO1	PO2	PO3	PO4	PO5
CO1	S	M	M	M	S
CO2	S	M	M	M	S
CO3	S	M	S	M	S
CO4	S	M	S	M	S
CO5	S	M	S	M	S

S – Strong, M – Medium, L – Low

17UML41M	MALAYALAM-IV	SEMESTER- IV
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Total Credits: 3

Hours Per Week: 4

CONTENTS**Drama & Folklore Paper IV. Drama & Folklore****Unit I, II & III**

A Drama

Unit IV & V

Folklore

TEXT BOOKS:

1. Unit I, II & III Lankalakshmi – C. N. Sreekantan Nair (D.C. Books, Kottayam).
2. Amkapurappadu – From Vadankanpattu Folk song. By Thikkurissi Gangadharan.

REFERENCE BOOKS:

1. Natyasasthram, K.P. Narayana Pisharodi, Trans. (Kerala Sahithya Akademi, Thrissur).
2. Malayala Nataka Sahithya Charithram, G. Sankara Pillai (Kerala Sahithya Akademi, Thrissur).
3. Malayala Nataka Sahithya Charithram, Vayala Vasudevan Pillai (Kerala Sahithya Akademi Thrissur).
4. Natakam – Oru Patanam (C. J. Smaraka Prasanga Samithi, Koothattukulam).
5. Natakaroopacharcha, Kattumadam Narayanan (NBS, Kottayam)
6. Folklore – Raghavan Payyanadu (Kerala Bhasha Institute, Trivandrum)

17UFL41F	FRENCH-IV	SEMESTER-IV
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Total Credits: 3**Hours Per Week: 4****Preamble:**

- To Acquire Competence in General Communication Skills - Oral + Written - Comprehension & Expression
- To Introduce the Culture, life style and the civilization aspects of the French people as well as of France

Course Outcomes:

On the successful completion of the course, students will be able to

CO Number	CO Statements	Knowledge Level
CO1	Learn the Basic verbs, numbers and accents	K1
CO2	To learn the adjectives and the classroom environment in France	K2
CO3	Learn the Plural, Articles and the Hobbies	K3
CO4	To learn the Cultural Activity in France	K3
CO5	To learn the Sentiments, life style of the French people and the usage of the conditional tense	K2

Mapping with Programme Outcomes

COS/POS	PO1	PO2	PO3	PO4	PO5
CO1	S	M	M	M	S
CO2	S	M	M	M	S
CO3	S	M	S	M	S
CO4	S	M	S	M	S
CO5	S	M	S	M	S

S - Strong, M - Medium, L - Low

17UFL41F	FRENCH-IV	SEMESTER-IV
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Total Credits: 3
Hours Per Week: 4

CONTENTS

Compétence Culturelle	Compétence de Communication	Compétence Grammatical
UNITÉ 6 - Problèmes problèmes		
<ul style="list-style-type: none"> Le bénévolat 	<ul style="list-style-type: none"> INTERACTION ORALE: Interroger sur la tristesse, l'abattement, exprimer sa sympathie, rassurer RÉCEPTION ORALE: Comprendre une interview à la radio RECEPTION ÉCRITE: Comprendre un test de magazine PRODUCTION ÉCRITE: Écrire une lettre à un(e) amie 	<ul style="list-style-type: none"> Les pronoms indéfinis rien, quelque chose Le verbe crier Du pluriel: eau, eu, al Se soigner, s'excuser, se renseigner, s'appeler La phrase négative: ne... plus, ne... jamais, ne... rien, ne... personne
UNITÉ 7 - C'est qui? C'est comment?		
<ul style="list-style-type: none"> Les classes sociales 	<p>INTERACTION ORALE: Décrire quelqu'un</p> <p>RECEPTION ORALE: Comprendre un bulletin météo</p> <p>RECEPTION ÉCRITE: Comprendre une courte interview</p> <p>PRODUCTION ÉCRITE: Écrire des notices biographiques</p>	<ul style="list-style-type: none"> Les adjectifs qualificatifs: Formes au masculin et au féminin Il fait beau, il neige, il pleut... Le verbe décrire Les verbes en -indre Les adjectifs possessifs féminins mon, ton, son devant voyelle ou h
UNITÉ 8 - Et après? Et après		
<ul style="list-style-type: none"> La mémoire et l'histoire 	<ul style="list-style-type: none"> INTERACTION ORALE: Raconter une anecdote, 	<ul style="list-style-type: none"> L'imparfait(2) Les verbes en -oir

	<p>une histoire, attire l'attention</p> <ul style="list-style-type: none"> • RÉCEPTION ORALE: Comprendre une interview à la radio • RÉCEPTION ÉCRITE: Comprendre des faits divers • PRODUCTION ÉCRITE: Écrire une brève 	<ul style="list-style-type: none"> • Les pronoms démonstratifs ça et cela • Prés de... Loin de... • La forme passive
UNITÉ 9 – Sûr et certain		
<ul style="list-style-type: none"> • L'université en France 	<ul style="list-style-type: none"> • INTERACTION ORALE Exprimer un point de vue, exprimer une certitude ➤ RÉCEPTION ORALE : Comprendre et apprécier un poème ➤ RÉCEPTION ÉCRITE : Comprendre un appel à participer à la vie collective ➤ PRODUCTION ÉCRITE : • Ecrire une lettre de motivation 	<ul style="list-style-type: none"> ➤ Le futur des verbes <i>parler, Avoir, être, voir</i> ➤ Le verbe <i>valoir</i> ➤ Par ➤ Les pronoms démonstratifs <i>celui-ci, celle -là</i>
UNITÉ 10 – Peut -être...peut-être		
<ul style="list-style-type: none"> • Le système de santé en France 	<ul style="list-style-type: none"> • INTERACTION ORALE : Exprimer une incertitude, exprimer l'évidence • RÉCEPTION ORALE : Comprendre et apprécier une chanson • RECEPTION ÉCRITE : Comprendre un débat d'idées • PRODUCTION ÉCRITE : Écrire au courrier des lecteurs 	<ul style="list-style-type: none"> • Les pronoms personnels objets, indirect <i>lui, leur</i> • L'impératif affirmative + COD et COL • Les verbes <i>en - ayer</i> ➤ L'interrogation à inversion

TEXT BOOK:

1. *Marcella Di Giura Jean-Claude Beacco, Alors II.* Goyal Publishers Pvt Ltd
86, University Block, Jawahar Nagar (Kamla Nagar), New Delhi -
110007.

17UEG42G	ENGLISH- IV	SEMESTER- IV
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Total Credits: 3**Hours Per Week: 4****PREAMBLE:**

To develop and enrich English language competencies of students in Functional English

COURSE OUTCOMES:

On successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO 1	Infer the prose works of R.K.Narayan, Stephen Leacock and Kasturi Sreenivasan.	K2
CO 2	Compare Indian poetry with British Poetry.	K4
CO 3	Analyse the themes in similitude by understanding the short stories.	K4
CO 4	Organize role plays after understanding the one act plays.	K3
CO 5	Test for Functional Grammar, Interviews skills, Group Discussions and Presentations.	K4

MAPPING WITH PROGRAMME OUTCOMES

COS/POS	PO1	PO2	PO3	PO4	PO5
CO1	M	S	M	S	M
CO2	S	M	S	M	S
CO3	S	M	S	S	M
CO4	M	S	S	S	S
CO5	S	M	S	M	S

S – Strong, M – Medium, L – Low

17UEG42G	ENGLISH- IV	SEMESTER- IV
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Total Credits: 3
Hours Per Week: 4

CONTENTS

UNIT I – PROSE

Sweets for Angels – R.K. Narayan’s - Biography- Narrative structure- Exploration of the text- passage analysis- insight of ideas- cohesion and context- style- language techniques

How to be a Doctor – Stephen Leacock’s - Biography- Narrative structure- Exploration of the text- passage analysis- insight of ideas- cohesion and context- style- language techniques

I prepared to go to Coimbatore – Kasthuri Srinivasan’s - Biography- Narrative structure- Exploration of the text- passage analysis- insight of ideas- cohesion and context- style- language techniques

UNIT II – POETRY

The Road Not Taken – Robert Frost’s - Biography- title indications- outline- paraphrasing the poem- context of poem- form- poetic devices- enjambment- techniques

Ode on a Grecian Urn – John Keats’s - Biography- title indications- outline- paraphrasing the poem- context of poem- form- poetic devices- enjambment- techniques

Indian Weavers – Sarojini Naidu’s - Biography- title indications- outline- paraphrasing the poem- context of poem- form- poetic devices- enjambment- techniques

UNIT III – SHORT STORIES

The Monkey’s Paw – W.W. Jacobs’s biography - Background- Setting- Plot overview- Characters- Themes, Symbols and Motifs - Critical analysis

The Imp and the Crust – Leo Tolstoy’s biography - Background- Setting- Plot overview- Characters- Themes, Symbols and Motifs - Critical analysis

The Doll’s House – Katherine Mansfield’s biography - Background- Setting- Plot overview- Characters- Themes, Symbols and Motifs - Critical analysis

UNIT IV - ONE ACT PLAYS

Never Never Nest - Cedric Mount's biography- Plot Summary- Detailed summary and Analysis- Themes- Important Quotations- Characters- Description- analysis- Terms- Symbols- Critical analysis

The Bishop's Candlesticks - Norman Mckline's biography- Plot Summary- Detailed summary and Analysis- Themes- Important Quotations- Characters- Description- analysis- Terms- Symbols- Critical analysis

UNIT V - FUNCTIONAL ENGLISH

Preparing for Interviews

Preparing for group discussions

Presentations

TEXT BOOK:

1. Board of Editors. **Melody**. Department of English., Dr. N.G.P. Arts and Science College (Autonomous), Coimbatore.

REFERENCE BOOKS:

2. V. Syamala, **Effective English Communication for You**. Emerald Publishers. Chennai.
2. N. Krishnaswamy, **Modern English: A Book of Grammar, Usage and Composition**. Macmillan India Ltd-New Delhi.
3. Wren & Martin, **High School English Grammar and Composition**. S. Chand Publishing 2006. New Delhi.

17UCY43A	CORE -IV : GENERAL CHEMISTRY - IV	SEMESTER - IV
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PREAMBLE

- To gain knowledge about metallurgy, acid - base concepts, synthesis of phenols, esters, amines and their properties, colligative properties of solution and the physical chemistry laws.

COURSE OUTCOMES

In the successful completion of the course, students will be able to

CO Number	Course Outcome Statement	Knowledge Level
CO1	Outline the methods involved in the extraction of different types of metals and its importance in the field of chemical metallurgy.	K2
CO2	Infer the knowledge in the fundamental aspects of acids and bases.	K2
CO3	Apply the basic aspects of phenols and its derivatives.	K3
CO4	Summarize the preparation of various amines and their reactions.	K2
CO5	Apply the colligative properties in solutions.	K3

MAPPING WITH PROGRAMME OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	S	M
CO2	S	S	S	M	S
CO3	S	S	S	S	S
CO4	S	M	S	S	S
CO5	M	M	S	S	S

S – Strong;

M - Medium;

L – Low

17UCY43A	CORE -IV : GENERAL CHEMISTRY - IV	SEMESTER - IV
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Credits: 5**Hours per week: 6****UNIT - I****Principles and Processes of Metallurgy**

Minerals - ores - occurrence of metals-classification of ores-various steps involved in the metallurgical processes- concentration of ores by froth floatation-gravity separation - magnetic separation processes- calcination - roasting - smelting - alumino thermic process - purification of metals by electro refining - zone refining-van Arkel process - furnaces- different types.

UNIT II**Acids and bases:**

Definitions, different approaches - Arrhenius concepts, Bronsted, Lowry concept, solvent system definition, Lewis definition. Relative strength of acids and bases. Acidity and basicity of solvolytic reaction. HSAB - Principle. Application & limitations of HSAB concept. Symbiosis, theories of hardness and softness. Electronegativity and hardness and softness. π Bonding contributions.

UNIT-III**Phenols**

Monohydric Phenols - preparation and properties, acidity of phenols, (No mechanism) reaction of monohydric phenols - Esterification, Nitration, Sulphonation, Halogenation, coupling with diazonium salts, Kolbe, Reimer-Tiemann, Fries rearrangement, Hoesch-Houben reaction and Gattermann reactions. Preparation and properties of Alpha and Beta- naphthols.

UNIT-IV

Amines and Diazo compounds

Preparation and reactions of amines, separation of a mixture of primary, secondary and tertiary amines – comparison of their basicity. Ring substitution, diazotization and coupling reaction of aromatic amines. Preparation, structure and their synthetic applications of diazomethane and diazoacetic ester.

UNIT-V

Solutions

Introduction - Solution of Gases in Gases-Henry's law-limitations of Henry's law. Solutions of liquids in liquids-solubility of partially miscible liquids. Phenol-water system. Solutions of solids in liquids-solubility- its equilibrium concept.

Dilute Solutions- Colligative properties- lowering of vapour pressure – Raoult's Law –derivation. Ideal solutions and deviations from Raoult's law. Determination of molecular mass from vapour pressure lowering. Elevation of Boiling point relation and determination of molecular mass. Depression of freezing point and determination of molecular mass from depression of freezing point. Measurement of freezing point depression –Rast's Camphor method.

Osmosis-silica garden and the egg experiment. Semipermeable membrane-Osmotic pressure- Determination of osmotic pressure by modern osmometer – isotonic solutions- Reverse osmosis.

TEXT BOOKS

1. *P.L. Soni, Textbook of Inorganic chemistry*, S. Chand & Co, 20th Edition.
2. *Arun Bahl, B. S. Bahl, Advanced Organic Chemistry*, S. Chand and Co, New Delhi, Revised multicolor edition, 2015.
3. *Arun Bhal, B.S. Bahl, G. D. Tuli, Essentials of Physical Chemistry*, S. Chand & Co, 2014.

REFERENCE BOOKS

1. *R. D Madan, 2011, Modern Inorganic chemistry*, S. Chand & Co, 3rd Edn.
2. *J. D. Lee, Concise Inorganic Chemistry*, Black Well Science, UK, 2006.
3. *B. Mehta, Manju Mehta, Organic Chemistry*, Prentice Hall of India Private Limited, New Delhi, 2005.
4. *I.L.Finar, 2007, Organic Chemistry Vol-I*, Pearson education, reprint 2007.
5. *B.R. Puri, L.R. Sharma, M.S. Pathania, Principles of Physical chemistry*, Vishal Publications, 2012.
6. *S. Glasstone, Devan Nostrand, Text book of physical chemistry*, Maxmillan Pub, 1974.

17UCY43P	CORE PRACTICAL II: VOLUMETRIC AND ORGANIC ANALYSIS	SEMESTER - IV
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Credits: 4
Hours per week: 4

I. Titrimetric Quantitative Analysis

a. Acidimetry and Alkalimetry:

1. Estimation of HCl by NaOH using a standard Oxalic acid solution.
2. Estimation of Na_2CO_3 by HCl using a standard Na_2CO_3 Solution.

b. Permanganametry:

1. Estimation of Oxalic acid by KMnO_4 using a standard Oxalic acid solution.
2. Estimation Iron (II) Sulphate by KMnO_4 using a standard Mohr's Salt solution.
3. Estimation of Calcium (II) by KMnO_4 using standard oxalic acid solution.

c. Dichrometry:

1. Estimation of Iron (II) by potassium dichromate using standard Mohr's salt solution.

d. Iodometry:

1. Estimation of KMnO_4 by Thio using a standard Potassium dichromate Solution.
2. Estimation of Copper (II) Sulphate by $\text{K}_2\text{Cr}_2\text{O}_7$ solution.

II. Organic analysis

Analysis of organic compounds

1. Preliminary tests
2. Detection of elements present
3. Aromatic or Aliphatic
4. Saturated or Unsaturated
5. Nature of the functional group
6. Confirmatory tests and Preparation of derivatives for the functional groups

The following functional group compounds may be given:

Aldehydes, Ketones, Amines (1° and 2° amines), Amides, Diamide, Carbohydrates, Phenols, Acids, Esters and Nitro compounds.

Substance to be given for organic analysis:

Cinnamic acid, benzoic acid, phthalic acid, aniline, benzamide, urea, benzaldehyde, acetophenone, phenol, cresols, glucose, toluidine, nitrobenzene,

ethylbenzoate.

REFERENCE BOOKS

1. *V. Venkateswaran, R. Veeraswamy, A.R. Kulandaivelu, Basic Principles of Practical Chemistry*, 2nd Edition, New Delhi, Sultan Chand and Sons, 1997.
2. *J. Mendham, R.C. Denney, J.D. Barnes and M. Thomas. Vogel's Text book of Quantitative Analysis*, 6th Edition, Pearson Education, 1989.
3. *R. Gopalan, P.S. Subramaniam and K. Rengarajan, Elements of Analytical Chemistry*, Sultan Chand and Sons, 2004.

17UMT4AB	ALLIED IV: MATHEMATICS - II	SEMESTER - IV
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PREAMBLE:

- On successful completion of course the students should have series of knowledge about the curvature, Beta, Gamma functions and its application.
- To learn the partial differential equation types and integration of vectors.

COURSE OUTCOMES

In the successful completion of the course, student will be able to

CO Number	CO Statement	Knowledge Level
CO 1	Learn about Double Integrals.	K1
CO 2	Learn the concept Curvature and Radius of curvature	K1
CO 3	Solve second order differential equations	K2
CO 4	Learn about the method of forming and solving Partial Differential Equations	K2
CO 5	Understand the application of Vector Calculus	K3

MAPPING WITH PROGRAMME OUTCOMES

COS/POS	PO1	PO2	PO3	PO4	PO5
CO 1	M	M	M	M	S
CO 2	M	M	M	S	S
CO 3	S	M	M	S	S
CO 4	M	S	M	S	M
CO 5	S	M	M	S	S

S- Strong;

M-Medium;

L-Low

17UMT4AB	ALLIED IV: MATHEMATICS - II	SEMESTER - IV
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Credits:4
Hours per week: 5

UNIT - I

Multiple Integrals: Double Integrals - Evaluation of double integrals - Triple Integral - Applications of double and triple integration.

UNIT - II

Differential Calculus: Introduction - Curvature and Radius of curvature - Gamma and Beta Function: Gamma function - Beta Function - Relation between Gamma and Beta Function.

UNIT - III

Differential Equations: Linear differential equations of second order with constant coefficient whose R.H.S is of the form ve^{mx} , where v is any function of x - Linear equations with variable coefficients.

UNIT - IV

Formation of partial differential equations by elimination of arbitrary constants and functions -Definitions of general, particular and complete solutions - Solving standard forms $f(p, q) = 0$, $f(x,p,q) = 0$, $f(y,p,q) = 0$, $f(z, p, q) = 0$, $f(x,p) = f(y,q)$ - Lagrange's Differential equations $Pp+Qq = R$.

UNIT - V

Scalar and vector fields -Differentiation of vectors - Gradient, Divergence and Curl -Integration of vectors - Line integral - Surface integral - Volume integral.

TEXT BOOK:

1. *Duraipandian, P and Udhyabaskaran, S. Allied Mathematics Volume II*, S. Chand and Company Ltd, New Delhi.

REFERENCE BOOKS:

1. *Abdul Rasheed, A. Allied Mathematics*, Vijay Nicole imprints (P) Ltd, Chennai.
2. *Narayan, S and Manicavachagam Pillai, T.K. 2002. Ancillary Mathematics*. Viswanathan Publishers and Printers Pvt. Ltd.
3. *Kandasamy. P and Thilagavathi. K. 2004. Allied Mathematics II*. S.Chand and Company Ltd, New Delhi.

17UCY4SA	SKILL BASED COURSE II: FOOD CHEMISTRY	SEMESTER - IV
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PREAMBLE

➤ To have an idea about food adulteration, gain knowledge about food preservation techniques, understand the chemistry of vinegar, fruit juices and vegetable acids; get an idea about beverages and to understand the calorific value of foods.

COURSE OUTCOMES

In the successful completion of the course, students will be able to

CO Number	Course Outcome Statement	Knowledge Level
CO1	Understand the food adulteration and the toxic chemicals present in foods.	K2
CO2	Extend their knowledge in the food preservation techniques and examine the advantages of food preservation.	K3
CO3	Demonstrate the chemical reactions and examine the changes occurring in food processing.	K2
CO4	Demonstrate and analyze the adulteration in beverages.	K2
CO5	Understand and determine the calorific value of foods.	K2

MAPPING WITH PROGRAMME OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	S	S
CO2	M	S	S	S	S
CO3	S	S	S	S	S
CO4	M	M	S	S	S
CO5	M	M	S	S	S

S – Strong;

M - Medium;

L – Low

17UCY4SA	SKILL BASED COURSE II: FOOD CHEMISTRY	SEMESTER - IV
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Credits: 3**Hours per week: 3****UNIT - I****Food Adulteration and Hygiene**

Definition - Food standards - Food Standards in India - Standards for ensuring quality of Products - Common adulterants in different foods - Contamination of foods with toxic chemicals, pesticides and insecticides. Contamination of food with harmful micro-organisms - Bacterial infections - Fungal contaminations of foods - Toxicants naturally occurring in some foods - Insect and rodent contamination of stored foods.

UNIT - II**Preservation of Food**

Introduction - Chemical Preservatives - Cold Storage - Foods preserved in Tinned Iron and Glass Containers - Inspection of Tinned foods - The action of Tinned foods on the container. Poisonous Metals in foods - Detection and determination of Tin, Lead and Copper, Zinc and Aluminium in foods - Arsenic in foods - The Gutzeit test for Arsenic - Examination of glucose for the presence of Arsenic, Antimony in beverages.

UNIT - III**Vinegar, Fruit Juices and Vegetable Acids**

Preparation and properties of Vinegar. Examination of Vinegar - Determination of Total Solids and examination of residue, Total acidity, Mineral acids in Vinegar, Colour reactions for the detection of mineral acids, Hydrogen ion Concentration, pH Value, Methods of determining pH,

detection of mineral acids in Vinegar by pH Value, Alcohol in Vinegar. Fruit Juices and Vegetable Acids: Examination of Lime Juice, Lemon Squash, etc.,

UNIT - IV

Beverages

Tea - Nature and Properties of Tea - Adulteration of Tea - Tea Infusions. Coffee - Nature and Properties of Coffee - Adulteration of Coffee with Chicory. Cocoa and Chocolate - Nature and properties of Cocoa and Chocolate - Adulteration of Cocoa. Alcoholic Beverages - Introduction - Determination of Alcohol - Proof Spirit - Denaturing of Alcohol.

UNIT - V

The Calorific Value of Foods

Introduction - The Bomb Calorimeter - Determination of the Calorific Value of a Substance, Outline of Method - Determination of the Water Equivalent of the Apparatus - Determination of the Calorific Value of Olive Oil and of Cooked Potato.

TEXT BOOKS

1. *C. Kenneth Tinkler and Helen Masters*, **Applied Chemistry**, Vol. II, 2nd Edition, London, 2005.
2. *M. Swaminathan*, **Advanced Text Book on Food and Nutrition**, Vol. II, 2nd Edition, 2003.
3. *B. Sri Lakshmi*, **Nutrition science**, New Age International Pvt. Ltd., New Delhi, 2002.

REFERENCE BOOKS

1. *M. Swaminathan*, **Handbook of Food and Nutrition**, The Bangalore Printing and Publishing Co. Ltd, 5th Edition, 2003.
2. *B. Sri Lakshmi*, **Food Science**, New Age International Pvt. Ltd., 3rd Edition, New Delhi, 2003.
3. *S. D. Venkataiah*, **Nutrition Education**, Anmol Publication Pvt. Ltd., 2004.

17UNM44Y	NMEC: II CHEMISTRY IN DAILY LIFE - II	SEMESTER - IV
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PREAMBLE

- To gain knowledge about chemistry involved in food processing and medicinal aspects.

COURSE OUTCOMES

In the successful completion of the course, students will be able to

CO Number	Course Outcome Statement	Knowledge Level
CO1	Acquire knowledge about pollutants and lubricants.	K2
CO2	Explain the facts and applications of milk and milk products.	K2
CO3	Outline the composition of blood and extend the concept to identify the chemical reactions occurring in our body.	K2
CO4	Extend the knowledge about the role of diet in specific diseases.	K2
CO5	Summarize the role of medicinal plants and to examine its properties in various fields.	K2

MAPPING WITH PROGRAMME OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	S	S
CO2	M	S	S	M	S
CO3	S	S	S	S	M
CO4	S	M	S	S	S
CO5	S	S	M	S	S

S – Strong;

M - Medium;

L – Low

17UNM44Y	NMEC: II CHEMISTRY IN DAILY LIFE - II	SEMESTER - IV
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Credits:2

Hours per week: 2

Unit - I**Chemistry in day today life**

Dry Cleaning of Clothes, Versatile Bleaching Agents. Environmental Pollution by Volatile Organic Solvents / Compounds (VOCs).

Lubricants

Definition, function of lubricants and properties. Examples, classification of lubrication, additives for lubricating oils, synthetic lubricants, greases and solid lubricants.

Unit - II**Milk and Milk Products**

Milk, Changes at Room Temperature, Methods of Routine Examination of Milk. Classification of bacteria, acid products, peptonizing organisms, fat splitters, pathogens. Milk Products - Butter, Cheese, Fermented Milk, Curd, Yogurt, Abnormal Changes in Milk and Milk Spoilage, Preservation of Milk and Milk Products.

Unit - III**Drugs**

Cardiovascular drugs, action, dosage and examples of cardiac glycosides, antiarrhythmic drugs, antihypertension drugs and vasodilator.

Blood and Hametological agents

Composition of blood, blood grouping and matching, role of blood as oxygen carrier, blood pressure, coagulation of blood. Determination of blood urea (using urease method only).

Unit - IV

Special diets for specific diseases

Peptic ulcer, diabetes, mellines, infective hepatitis, heart disease and hypertension.

Unit - V

Indian medicinal plants

Medicinal properties and uses of Hibiscus Rosasinesis, adathoda vasica, Ocimum sanchum, Mangifera Indica, Azadirachtra Indica, Phyllantum Niruri, Solatum Trolbafum.

TEXT BOOKS

1. *P.C. Jain and Monika Jain, Engineering Chemistry*, Dhanpat Rai & Sons, Delhi 5th edition, (2013) .
2. *B. Sri Lakshmi, Food Science*, New Age, 5th edition, 2011.

REFERENCES

1. *Jayashree Ghosh, A Text Book of Pharmaceutical Chemistry*, S. Chand & Company Pvt Ltd, 3rd edition, 2010.
2. *A.K. De. Environmental Chemistry*. New Age, 7th edition, 2007.

17UFC4FA	பகுதி – 4 : தமிழ்த் தாள் - 2 அடிப்படைத் தமிழ்	SEMESTER - IV
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Total Credits: 2
Hours Per Week: 2

(10 மற்றும் 12- ஆம் வகுப்பு வரை தமிழ் மொழிப்பாடம் பயிலாதவர்களுக்கு)
(பருவத் தேர்வு உண்டு)

அலகு: 1 நீதி நூல்கள்

- ஆத்திசூடி (முதல் – 12 பாடல்கள்) – “அறம் செய விரும்பு” முதல் “ஒளவியம் பேசேல்” வரை
- கொன்றை வேந்தன் (முதல் – 7 பாடல்கள்)- அன்னையும் பிதாவும் முன்னறி தெய்வம்” முதல் எண்ணும் எழுத்தும் கண் எனத் தகும்” வரை
- திருக்குறள் (6 பாடல்கள்)
1.அகர முதல (1),
2. மனத்துக் கண்.....(34)

3. இனிய உளவாக(100) ,

4.தீயவை தீய பயத்தலான்..(202)

5. கற்க கசடற(391) ,

6.கண்ணோடு கண்ணினை..(1100)

அலகு : 2 அ) எளிய நீதிக்கதைகளும் வாழ்க்கை முறைகளும்

- நீதிகாத்த மன்னன்
- சிங்கமும் முயலும்
- புத்திசாலி உழவனும் போக்கிரிப் பூதமும்
- தேனியும் புறாவும்
- முயல் கூறிய தீர்ப்பு

ஆ) தமிழகப் பண்பாடுகள் : (சொற்களைத் தொடராக்குதல்)

- தமிழர் விழாக்கள் (பொங்கல், ஆடிப்பெருக்கு)
- தமிழர் கலைகள் (தெருக்கூத்து, ஓவியம், சிற்பம்,)

- தமிழர் விளையாட்டுகள் (ஏறுதழுவுதல், சடுகுடு)

17UFC4FB	பகுதி - 4 : சிறப்புத் தமிழ் தாள் -2	SEMESTER - IV
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Total Credits: 2
Hours Per Week: 2

(10 மற்றும் 12-ஆம் வகுப்புகளில் தமிழ் மொழிப்பாடம் பயின்றவர்களுக்கு உரியது)
(பருவத் தேர்வு உண்டு)

அலகு - 1: மரபுக் கவிதைகள்

அ)பாரதியார் கவிதைகள்

- தமிழ்நாடு
- மனதில் உறுதி வேண்டும்
- வருகின்ற பாரதம் (பா.எண்.5-8)

ஆ)பாரதிதாசன் கவிதைகள்

- இன்பத்தமிழ்
- நீங்களே சொல்லுங்கள்
- உலக ஒற்றுமை
- வாளினை எட்டா!

அலகு - 2 : புதுக்கவிதைகள்

- கம்பன் கவியரங்கக் கவிதை - மு.மேத்தா
- தமிழா! நீ பேசுவது தமிழா! - காசியானந்தன்
- நட்புக் காலம் (10 கவிதைகள்) - அறிவுமதி கவிதைகள்

அலகு - 3 : இலக்கணம்

- வல்லினம் மிகும் மற்றும் மிகா இடங்கள்
- ர, ற, - ல, ழ, ள - ந, ண, ன - வேறுபாடு அறிதல்

அலகு - 4: கடிதங்கள் எழுதுதல்

- பாராட்டுக் கடிதம்
- நன்றிக் கடிதம்
- அழைப்புக் கடிதம்
- அலுவலக விண்ணப்பங்கள்

அலகு - 5: பாடம் தழுவிய வரலாறு

- பாரதியாரின் இலக்கியப் பணி
- பாரதிதாசனின் இலக்கியப்பணி
- மரபுக்கவிதை, புதுக்கவிதை - விளக்கம்

17UFC4FC	GENERAL AWARENESS	SEMESTER - IV
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Total Credits: 2
Hours Per Week: 2

CONTENTS

Verbal Aptitude

Numerical Aptitude

Abstract Reasoning

Tamil and Other Literature

General Science and Technology and Education

Computer Science

Economics and Commerce

History and Freedom Struggle

Sports

Current Affairs

17UCY53A	CORE -V: INORGANIC CHEMISTRY - I	SEMESTER - V
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PREAMBLE

- To gain knowledge about the nuclear reactions, radio activity, coordination compounds and its structures

COURSE OUTCOMES

In the successful completion of the course, students will be able to

CO Number	Course Outcome Statement	Knowledge Level
CO1	To apply the knowledge of nuclear chemistry to detect the isotopes using spectrographs. Broadening the knowledge about radioactivity and application radioactive isotopes in various fields.	K3, K4
CO2	To understand the concepts about nuclear fission and fusion reactions and problems arising due to nuclear wastes.	K3
CO3	Acquire knowledge about fundamentals of coordination chemistry which includes classification of ligands, detection of complexes. To analyze the stability of complexes using EAN rule.	K2, K3
CO4	Analyzing the stability and energy of complexes by applying CFT and VBT concepts to octahedral, square planar and octahedral complexes. To understand about application and limitations of CFT.	K3
CO5	Analyze the physical and chemical properties of different types of inorganic and organic solvents.	K3

MAPPING WITH PROGRAMME OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	S	S
CO2	M	S	S	S	S
CO3	S	S	S	S	S
CO4	M	M	S	S	S
CO5	M	M	S	S	M

S – Strong;

M - Medium;

L – Low

17UCY53A	CORE - V INORGANIC CHEMISTRY - I	SEMESTER - V
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Credits:5**Hours per week: 5****UNIT - I****Nuclear Chemistry - I**

Introduction - Nuclear stability and n/p ratio. Magic numbers. Packing fraction. Mass defect and binding energies. Definition for isotopes, isobars and isotones. Detection of isotopes - mass spectrographs-Thomson's, Dempster's and Aston's mass spectrographs- Importance of discovery of isotopes. Radioactivity -emission of alpha, beta and gamma rays. Radioactive disintegration -first order kinetics - half-life period. Radioactive disintegration series. Uses of radioactive isotopes - medicine - agriculture - C¹⁴ dating - dating of Universe.

UNIT - II**Nuclear Chemistry - II**

Nuclear reactions - fission, fusion, spallation, capture and particle-particle reactions - nuclear fission-nuclear reactors- Atom bomb- nuclear fusion - Stellar energy- Hydrogen bomb. Artificial transmutation of elements. Artificial radioactivity. Atomic power projects in India- Disposal of nuclear wastes. Problems.

UNIT - III**Coordination Chemistry- I**

Definition of some terms - classification of ligands - Chelation - Coordination number and stereochemistry of complexes - Nomenclature of coordination compounds - Detection and structure determination of complexes - Werner's Coordination theory - Sidgwick's electronic interpretation of coordination - Sidgwick's concept of Effective Atomic Number - EAN concept and EAN rule.

UNIT - IV**Coordination Chemistry- II**

Valence bond theory – Formation of Octahedral complexes on the basis of VBT – Formation of tetrahedral and square planar complexes on the basis of VBT – Limitations of VBT. Crystal field Theory and its importance features – Crystal Field Splitting of d-orbitals – Factors affecting the magnitude of Δ_o – Application of CFT – Distortion of octahedral complexes and Jahn-Teller theorem. Causes of distortion with examples – Crystal Field Stabilisation Energies (CFSE's) – Uses of CFSE's values – Limitations of CFT.

UNIT - V**Solvents**

Classification of solvents - Solubility of compounds. Effect of temperature on solubility -role of H₂O as solvent, chemical structure and solubility - General behaviour - Properties of ionizing solvents - Types of reactions in solvents - Specific non aqueous solvents - Protic solvents, NH₃, HF. Aprotic solvents - SO₂, BrF₃. molten salt, carbonic solvents - Ethanol, ether.

TEXT BOOKS

1. R. D. Madhan, G. D. Tuli, and S. M. Malik, **Selected Topics in Inorganic Chemistry**, S. Chand & Co., New Delhi, 2006.
2. B. R. Puri, L. R. Sharma, K. K. Kalia, **Principles of Inorganic Chemistry**, Milestone Publishers and Distributors, New Delhi, 2008.
3. R. D. Madan, **Modern Inorganic Chemistry**, S. Chand & Co., New Delhi, 2004.
4. U. N. Dash, **Nuclear Chemistry**, S. Chand & Co., New Delhi, 2010.
5. H.J. Arniker., **2001 Essentials of Nuclear Chemistry**, New Age International P.Ltd Publishers, 4th Edn.
6. P.L.Soni, Mohan katyal, **Textbook of Inorganic Chemistry**, S. Chand & Co., New Delhi, 20th Edn, 2005.

REFERENCE BOOKS

1. *M. G. Arora, M. Singh, Nuclear Chemistry*, Anmol publications Pvt. Ltd., New Delhi, 1998.
2. *Sathya Praksash, G.D. Tuli, S. K. Basu, R.D. Madhan, Advanced Inorganic Chemistry*, Vol. 1, S. Chand & Co., New Delhi, 2012.
3. *James.E.Huhey, Ellen.A.Keiter, Richard L Keiter, Okhil K.Medhi, Inorganic Chemistry - Principle Sturcture and Reactivity*, Pearson Publishers 9th Edn, 2011.

17UCY53B	CORE -VI ORGANIC CHEMISTRY - I	SEMESTER - V
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PREAMBLE

- To study asymmetry and optical activity of organic molecules, some novel named reactions, important organic rearrangements, chemistry of amino acids, proteins and peptides, reactions and properties of heterocyclic compounds

COURSE OUTCOMES

In the successful completion of the course, students will be able to

CO Number	Course Outcome Statement	Knowledge Level
CO1	Understanding the fundamental aspects of stereochemistry which includes asymmetric carbon, optical isomerism, resolution and asymmetric synthesis.	K2, K3
CO2	Study on the various naming reactions and their detailed mechanistic pathway.	K2,K3
CO3	Broadening the concepts of molecular rearrangements by comparing the reaction mechanisms.	K3
CO4	To acquire the knowledge of preparation, properties and synthesis of amino acids, proteins and peptides. To analyze the structures of proteins and peptides.	K3
CO5	To analyze the heterocyclic compounds in terms of physical and chemical properties and to have insight on their preparation.	K3

MAPPING WITH PROGRAMME OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5
CO1	M	S	S	S	S
CO2	M	S	S	S	S
CO3	S	S	S	S	S
CO4	M	M	S	S	S
CO5	M	M	S	S	S

S – Strong;

M - Medium;

L – Low

17UCY53B	CORE -VI ORGANIC CHEMISTRY - I	SEMESTER - V
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Credits: 4**Hours per week: 4****UNIT-I****Stereochemistry**

Optical Isomerism, cause of optical activity, plane polarized light, specific rotation, asymmetric carbon atom, chirality, Optical isomerism of lactic acid and tartaric acid. Enantiomers and diastereo isomers. Resolution of Racemic mixture – mechanical separation – kinetic separation – selective adsorption – chemical method – biochemical method. Racemization, Asymmetric synthesis, Walden inversion. Specifying absolute configuration – R , S system for asymmetric molecule. Optical activity of Biphenyl, Allenes and Spiranes.

UNIT-II**Specific name reactions and mechanism**

Reactions, evidences and applications of – Clemmensen reduction, Friedlander synthesis, Gattermann-Koch aldehyde synthesis, Kolbe – Schmidt reaction, Michal addition, Mannich reaction and Benzoin condensation, Wolf – Kishner reduction.

UNIT-III**Molecular Rearrangements with mechanism**

Reaction, evidences, mechanism, and applications of molecular rearrangement reactions - Pinacol-Pinacolone, Beckmann, Hoffmann, Curtius, Benzilic acid and Claisen Rearrangements.

UNIT-IV**Amino acids, Proteins and peptides**

Amino acids – Nomenclature, dipolar nature of amino acids, isoelectric point, methods of preparation – amination of halo acids – Strecker synthesis –

Gabrielphthalimide synthesis - Koop synthesis. Physical and chemical properties of amino acids. N-terminal and C-terminal amino acid residues. Proteins, classification - according to chemical composition. Structure of proteins - primary - secondary and tertiary structure. General properties of proteins. Industrial importance of proteins. Colour test for proteins. Nomenclature of peptides - determination of structure of peptides - end group analysis - synthesis of peptides.

UNIT-V

Heterocyclic compounds

Introduction- preparation - physical and chemical properties of Furan, Pyrrole, Thiophene, Pyridine, Quinoline and Isoquinoline (including electrophilic and nucleophilic substitution reactions).

TEXT BOOKS

1. *Arun Bahl and B.S.Bahl, Advanced Organic Chemistry*, S. Chand and Co., New Delhi, 2012.
2. *Gurdeep. R. Chatwal, Reaction Mechanism and Reagents in Organic Chemistry*, Himalaya Publishing House Delhi, 2013.
3. *M.K. Jain, S.C. Sharma, Modern Organic Chemistry*, Vishal Publishing Co., Delhi, 2011.
4. *Jerry March, Advanced Organic Chemistry*, John Wiley & Sons, New York, 4th Edn, 1930

REFERENCE BOOKS

1. *M.G Arora, Stereochemistry in Organic Compounds*, Anmol Publications Private Ltd New Delhi, 2008.
2. *Jagdamba Singh and Yadav, Organic Synthesis*, Vol.I and II. Pragathi and Prakasam Publishers, 1st Edition, 2005.
3. *I.L.Finar, Organic Chemistry*, Vol.I and II, Addison-Wesley Longman, 2009.

17UCY53C	CORE -VII PHYSICAL CHEMISTRY - I	SEMESTER - V
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PREAMBLE

- To understand the fundamental concept of electrochemistry, importance of electro chemical cells, electrodes and their types, polarography and surface chemistry

COURSE OUTCOMES

In the successful completion of the course, students will be able to

CO Number	Course Outcome Statement	Knowledge Level
CO1	To obtain the basic concepts of electrochemistry and apply it to develop the theory and experimental approaches for the electrochemical problems.	K2, K3
CO2	To acquire basic knowledge of electrode potentials and electrochemical cells.	K3
CO3	To acquire knowledge about the types of electrodes and potentiometric titrations.	K3
CO4	To learn the use of fundamental principles of fuel cells and to know their practical utility. To acquire the basic knowledge of electrochemical processes and their application related to corrosion field.	K3
CO5	To provide the basic concepts of polarography, instrumentation- functions and their applications. To gain a knowledge on the fundamentals of sorption and their applications.	K2, K3

MAPPING WITH PROGRAMME OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5
CO1	M	S	S	S	S
CO2	M	S	S	S	S
CO3	S	S	S	S	S
CO4	M	M	S	S	S
CO5	M	M	S	S	S

S - Strong;

M - Medium;

L - Low

17UCY53C	CORE-VII PHYSICAL CHEMISTRY - I	SEMESTER - V
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Credits:4**Hours per week: 4****UNIT - I****Fundamentals of Electrochemistry**

Introduction-Classification of conductors - Electrolytic conductance-conductivity cell measurement of conductance of solutions - Variation of equivalent conductance and specific conductance with dilutions. Migrations of ions - Transport number - determination by moving boundary method and Hittorf's method - Kohlrausch's law - statement, application. Arrhenius theory of electrolytic dissociation - Ostwald's dilution law and limitations - theory of strong electrolytes: Debye-Huckel - Onsager theory (elementary treatment only) -Debye- Falkenhagen effect and Wien effect. Applications of conductance measurements:i) Determination of λ^∞ for weak electrolyte (ii) Determination of dissociation constant of a weak organic acid (iii) Conductometric titrations - acid-base titration.

UNIT - II**Electro Chemical Cells**

Galvanic cell - Reversible and irreversible cells - Electrode potentials - The standard hydrogen electrode-kinds of electrode and their potentials - Nernst equation - Computation and measurement of cell emf. Weston - Cadmium cell - Single electrode potentials. Determination and significance of electrode potentials - Electrochemical series and its applications. Thermodynamic quantities of cell reaction.

pH scale -Problems.

UNIT - III

Electrodes and their types

Reference electrodes - Electrodes for measurement of pH - Hydrogen, quinhydrone, and glass electrodes. Buffer solutions - Buffer action, determination of pH values of Buffer mixture and Henderson's equations. Concentration cells with and without transport - Liquid junction potential - Applications of emf measurements - Redox Potentials - redox indicators - diphenyl amine - Potentiometric titrations - acid-base and redox titrations.

UNIT - IV

Fuel Cells and Corrosion

Fuel cells - Definition and importance, Hydrogen-Oxygen fuel cell, hydrocarbon - Oxygen cell. Storage cells, Lead storage cell, Nickel- Cadmium cell and Lithium ion cell (basics only). Decomposition Voltage, Over voltage, Deposition or Discharge Potential.

Corrosion -Definition, types, electrochemical nature, rusting of iron, prevention - cathodic protection and galvanizing.

UNIT - V

Polarography and Adsorption

Polarography-instrumentation- advantages and disadvantage of dropping mercury electrode-Limiting current, factors affecting limiting current-Half wave potential- Application of polarography.

Sorption - Absorption, Adsorption-Types of adsorption, adsorption of gases by solids. Adsorption isotherms -Freundlich, Langmuir. Adsorption of solutes from solutions. Application of adsorption.

TEXT BOOKS

1. *P. L. Soni, O. P. Dharmarha and U. N. Dash, Textbook of physical chemistry, S.Chand & Co., New Delhi, 2013.*

2. *B. R. Puri, L. R. Sharma, M. S. Pathania, Principles of Physical Chemistry*, S.Chand & Co., New Delhi, 2009.
3. *B.S. Bahl and G. D. Tuli, and Arun Bahl, Essentials of Physical Chemistry*, S. Chand publishing, Revised multicolor edition, 2012.
4. *P. C. Jain and Monika Jain, Engineering Chemistry*, Dhanpat Rai Publishing Co., New Delhi, 2006.
5. *Gurdeep Raj, Advanced Physical Chemistry*, GEOL Publishing House, Meerut, 21st Edn, 1997.

REFERENCE BOOKS

1. *Karen C. Timberlake, Basic Chemistry*, Los Angeles Valley College, Pearson Benjamin Cummings New York, 1st edition, 2005.
2. *Samuel Glasstone, Introduction to Electrochemistry*, EWP (East-West Press) Pvt. Ltd., 2002.
3. *Syed Aftab Iqbal, Text Book of Electrochemistry*, Discovery Publishing house Pvt. Ltd., New Delhi, 2011.

17UCY5SA	SKILL BASED COURSE - III INDUSTRIAL CHEMISTRY	SEMESTER - V
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PREAMBLE

➤ To gain knowledge about manufacture of sugars, have a thorough idea about Fermentation, knowledge about Glass, have knowledge about Cement and Ceramics, have a thorough idea about Paints and Pigments.

COURSE OUTCOMES

In the successful completion of the course, students will be able to

CO Number	Course Outcome Statement	Knowledge Level
CO1	To know about different sources of sugar and commercial manufacture of sugar.	K2, K3
CO2	To acquire knowledge in the fermentation process and extend its uses in the manufacture of beverages.	K2,K3
CO3	To summarize the manufacture of glass. To compare and correlate the properties of different glasses.	K2,K3
CO4	To gain knowledge in the cement and ceramic manufacturing process. Experiment its application in real life needs.	K2, K3
CO5	Acquire knowledge in paints and pigments and its application in various fields.	K2, K3

MAPPING WITH PROGRAMME OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	S	S
CO2	M	S	S	S	S
CO3	S	S	S	S	S
CO4	M	M	S	S	S
CO5	M	M	S	S	S

S - Strong;

M - Medium;

L - Low

17UCY5SA	SKILL BASED COURSE - III INDUSTRIAL CHEMISTRY	SEMESTER - V
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**Credits: 3 Hours per
week: 3**

UNIT-I

Sugar Industry

Introduction - manufacture of cane sugar - Extraction of juice - Purification of juice - Defection -sulphitation and carbonation. Concentration or evaporation - Crystallization - separation of crystals - Drying - Refining - Grades. Recovery of sugar from molasses. Manufacture of sucrose from Beetroot.

UNIT - II

Fermentation

Introduction - historical - conditions favourable for fermentation. Characteristics of enzymes -short account of some fermentation processes. Alcohol beverages - manufacture of beer, wines, vinegar and power alcohol. Ethyl alcohol from molasses.

UNIT-III

Glass

Introduction - Physical and chemical properties of glass - Raw materials - Methods of manufacture. Formation of the batch material - melting - shaping - annealing and finishing.
Types of Glasses - soda glass - flint glass - pyrex glass - jena glass and safety glass.

UNIT - IV

Cement and Ceramics

Cement: Manufacture of cement - Settling of cement (Portland cement)
Ceramics: Manufacturing process - Application of colours to the pottery - Earthenware's and Stonewares.

UNIT V

Pigments and Paints

Pigments: Introduction -Requirements of a pigment - Typical inorganic pigments - Applications.

Paints: Classification of paints - Distempers - Constituents of paints - Settling of paint -Requirements of a good paint - Emulsion paints - Latex paints - Paint removers - Varnishes - Solvents and thinners.

TEXT BOOKS

1. Sharma B.K., **Industrial Chemistry**, Goel Publishing House, Meerut, 2003.
2. Jain & Jain., **Engineering Chemistry**, Dhanpat Rai Publishing Company Private Ltd, New Delhi, 1998.

REFERENCE BOOKS

1. *J.R.Kapuria*, **Paint Manufacture**, SBP Board of Consultants and Engineers PVT Ltd., New Delhi, 1996.
2. *M.M. Uppal*, **A Text Book of Engineering Chemistry**, Khanna Publishers, New Delhi, 1998.
3. *R. Gopalan, D. Venkappayya, S. Nagarajan*, **Engineering Chemistry**, Vikas Publishing House PVT Ltd., Reprint 2000.
4. *H. L. Whitc*, **Introduction to Industrial Chemistry**, A Wiley Interscience Publication (John Wiley & Sons), 1986.

17UCY63A	CORE -VIII INORGANIC CHEMISTRY - II	SEMESTER - VI
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PREAMBLE

- To have an idea about metallic properties, different types of solids, different types of symmetry, reactions of complexes, bio-inorganic chemistry.

COURSE OUTCOMES

In the successful completion of the course, students will be able to

CO Number	Course Outcome Statement	Knowledge Level
CO1	To understand the difference between amorphous and crystalline solids and their arrangement in crystal lattice.	K3
CO2	To analyze the difference between stoichiometric and non-stoichiometric defects. To understand the various theories of metallic bonding and their application in semiconductors and alloys.	K2, K3
CO3	Solving the various crystal structures using X-ray diffraction techniques and study their symmetry operations of simple molecules.	K3
CO4	To analyze the various ligand substitution reactions in octahedral and square planar geometry by applying basic aspects of coordination chemistry To understand the electron transfer reactions in inorganic complexes.	K3
CO5	Demonstrate the various porphyrin systems and enzymes with respect to their biological functions. Analyze the role of alkali and alkaline earth metals in biological system and to know about their function and toxicity.	K3

MAPPING WITH PROGRAMME OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	S	S
CO2	M	S	S	S	S
CO3	S	S	S	S	S
CO4	M	M	S	S	S
CO5	M	M	S	M	S

S - Strong;

M - Medium;

L - Low

17UCY63A	CORE -VIII INORGANIC CHEMISTRY - II	SEMESTER - VI
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Credits:5**Hours per week: 5****UNIT-I****Solid State - I**

Amorphous and crystalline solids , symmetry in crystals, elements of symmetry of a crystal, space lattice and unit cell, Bravais lattices, seven crystal system, Designation of planes in crystals – Miller indices, close packing of identical solid spheres (CCP, FCC, HCP and BCC), radius ratio rule and shape of ionic crystal. Number of particles per unit cell and density of crystals.

UNIT - II**Solid State - II**

1. Defects in crystal – Stiochiometric and non Stiochiometric defects.
2. Metallic bonding- theories- electron gas theory, Valence bond theory, Molecular orbital theory (Band theory) –True metal or conductor, insulators, semi conductors- types of semi conductors- intrinsic and extrinsic, n and p-type.
3. Alloys- substitutional and interstitial solid solutions, inter metallic compounds – Hume – Rothery rule.

UNIT - III**Symmetry of Molecules**

X-ray diffraction studies of crystals – Bragg's equation – Bragg method and powder method – crystal structure of NaCl and ZnS. Symmetry elements in crystals (with respect to cubic crystals).

Symmetry in molecules –symmetry elements and symmetry operation in simple molecules. (NH₃, H₂O, CO₂).

UNIT - IV**Coordination Chemistry**

Ligand substitution reactions in octahedral complexes - SN₁ and SN₂ mechanisms.

Ligand substitution reactions in Square – planar complexes : trans effect – trans effect series, theories of trans effect – Electrostatic polarization theory and pi bonding theory.

Electron transfer reactions – Inner sphere and outer sphere mechanism, Complementary and non complementary electron transfer reaction.

UNIT – V

Bioinorganic chemistry

Porphyrin systems-Myoglobin and hemoglobin-Role of myoglobin and hemoglobin in biological systems – cooperativity effect – explanation of cooperativity effect in hemoglobin. Metallo enzymes – inhibition and poisoning of enzymes – role of alkali and alkaline earth metals in biological systems –sodium pump –calcium pump – biological functions and toxicity of some elements (Cr,Mn,Co,Ni,Cu,As,I,Hg)– biological fixation of nitrogen.

TEXT BOOKS

1. SathyaPrakash, G.D. Tuli, S.K. Basu, R.D. Madhan,**Advanced Inorganic Chemistry**volume 1, S. Chand & Company, New Delhi, 2012.
2. Wahid Malik, G.D Tuli, R.D. Madhan,**Selected Topics in Inorganic Chemistry**, S. Chand & Company, New Delhi, 2006.
3. B.R.Puri,L.R.Sharma and K.C.Kalia,**Principles of Inorganic Chemistry**, Milestone Publishers, New Delhi, 2009.
4. Gurdeep Raj,**Advanced Inorganic Chemistry** , Vol.1 , Goel Publishing House, Meerut, 2011.
5. P.L.Soni, Mohan katyal,**Textbook of Inorganic Chemistry**, S. Chand & Co., New Delhi, 20th Edn, 2005.

REFERENCE BOOKS

1. M.G. Arora, **Solid State Chemistry**, Anmol Publishing House, New Delhi, 1997.recent edition

2. *R.D.Madhan, **Modern Inorganic Chemistry**, S.Chand & Company, New Delhi 2011.*
3. *Asim K.Dass, **Bioinorangic Chemistry**, Books and Allied (p) Ltd, Kolkata, 2007.*
4. *James E.Huheey, Ellen A. Keiter, Richard L. Keiter, Okhil K. Medhi, **Inorganic Chemistry Principles of Structure and Reactivity**, Dorling Kindersely (India) PVT.Ltd, 4th Edn, 2013.*

17UCY63B	CORE -IX ORGANIC CHEMISTRY - II	SEMESTER - VI
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PREAMBLE

- To have an idea about terpenoids, alkaloids, carbohydrates, Vitamins and Hormones and further an idea about chemotherapy

COURSE OUTCOMES

In the successful completion of the course, students will be able to

CO Number	Course Outcome Statement	Knowledge Level
CO1	Study on the classification, structural elucidation and synthesis of few important terpenoids.	K2, K3
CO2	To gain the knowledge of alkaloids and to analyze the methods of structural determination and synthesis.	K3
CO3	To acquire basic knowledge about vitamins and their deficiency diseases. To study the synthesis and structural elucidation of few important vitamins and hormones.	K3
CO4	To demonstrate the various applications of mono- and disaccharides including preparation, structural elucidation, physical and chemical reactions.	K3
CO5	To analyze structural aspects, functions and mode of action of various drug molecules.	K3

MAPPING WITH PROGRAMME OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	S	S
CO2	M	S	S	S	S
CO3	S	S	S	S	S
CO4	M	M	S	S	S
CO5	S	S	S	S	S

S - Strong;

M - Medium;

L - Low

17UCY63B	CORE - IX ORGANIC CHEMISTRY - II	SEMESTER - VI
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Credits:4Hours
per week: 4

UNIT -I

Terpenoids

Introduction, classification and general methods of isolation. Isoprene rule, structural elucidation and synthesis of Geraniol, β -Carotene, Carvone and α -pinene.

UNIT-II

Alkaloids

Introduction, classification, general characteristics and general methods of determining structures and Hoffmann's exhaustive methylation. Structural elucidation and synthesis of Nicotine, Quinine, Piperine and Morphine.

UNIT - III

Vitamins and Hormones

Introduction, classification, sources of Vitamins and their deficiency diseases. Structural elucidation and synthesis of Thiamine and Riboflavin.

Hormones - Introduction, structural elucidation and synthesis of adrenaline and thyroxine.

UNIT-IV

Carbohydrates

Introduction, classification, Mono saccharides - occurrence, preparation, structural elucidation, properties and uses of Glucose and Fructose. Cyclic form of glucose and fructose. Mutarotation, interconversion of glucose to fructose and vice versa.

Disaccharides - Structure, preparation, properties and uses of sucrose and maltose. Polysaccharides - starch and cellulose - Isolation, structure and properties. Derivatives of cellulose.

UNIT-V

Chemotherapy

Designation of drugs based on physiological action – functional and pharmacodynamic drugs – chemotherapeutic drugs. Definition and two examples each of antibacterial drugs- sulpha drugs and mode of action of sulpha drugs, Antimalarial drugs, Amebicidal drugs, Antiseptics, Anaesthetics, Analgesics – Narcotic and synthetic- Antipyretics and anti-inflammatory agents - Antibiotics - Penicillin, streptomycin, and tetracyclins.

TEXT BOOKS

1. Arun Bahl and B.S.Bahl, **Advanced Organic Chemistry**, S. Chand and Co., New Delhi, 2012.
2. **Modern Organic Chemistry** M. K. Jain and S. C. Sharma, Revised Edition, Vishal Publishing Co., Delhi 2011.
3. Jagdamba Singh and Yadav, **Organic Chemistry**, Vol. I and II, Pragathi Prakasam Publishers 1st Edition. 2005.

REFERENCE BOOKS

1. I. L. Finar, **Organic Chemistry**, Vol. I, Addison-Wesley Longman, 2010.
2. I. L. Finar, **Organic Chemistry**, Vol. II, Addison-Wesley Longman, 2010.
3. Gurdeep Chatwal, **Organic Chemistry of Natural Products**, Himalaya Publishing House, New Delhi, 2013.
4. Morrison R.T. and Boyd R.N, **Organic Chemistry** (6th edition), New York, Allyn & Bacon Ltd., 2008.

17UCY63C	CORE -X PHYSICAL CHEMISTRY - II	SEMESTER - VI
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PREAMBLE

- To understand the basics of chemical kinetics, study the theoretical aspects of various orders and the relationship between temperature and rate of a reaction, about activation energy and complex thermal reactions and to have an idea about photochemical reactions, about catalytic reactions and importance of catalysts, know the action of colloids and their role in daily life.

COURSE OUTCOMES

In the successful completion of the course, students will be able to

CO Number	Course Outcome Statement	Knowledge Level
CO1	To develop the knowledge on principles of chemical kinetics and rate laws of chemical reactions. To apply the principles of chemical kinetics on various experimental techniques.	K2, K3
CO2	Broadening the concepts of chemical kinetics by theoretical aspects.	K3
CO3	To study about various photochemical and photosensitized process.	K3
CO4	To understand various types of catalysis reactions and to explore their applications in industrial sector.	K3
CO5	To provide the fundamentals of colloids and their applications.	K2, K3

MAPPING WITH PROGRAMME OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	S	S
CO2	M	S	S	S	S
CO3	S	S	S	S	S
CO4	M	M	S	S	S
CO5	S	S	S	S	S

S - Strong;

M - Medium;

L - Low

17UCY63C	CORE - X: PHYSICAL CHEMISTRY - II	SEMESTER - VI
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Credits: 4**Hours per week: 4****UNIT- I****Chemical Kinetics-I**

Empirical laws and experimental aspects. Rate law, stoichiometry, order and molecularity of reactions. Setting up and solving simple differential equations for first order, second order, third order and zero order reaction. Expressions for half - life periods of first order, second order, zero order and third order reactions. Determination of order of reactions. Experimental techniques involved in the following kinetics of reaction. Volumetry, Polarimetry and Colorimetry. Typical examples for each of the techniques.

UNIT- II**Chemical Kinetics-II**

Theoretical aspects: Effect of temperature on the reaction rate. The activation energy. Significance of free energy of activation. The collision theory of reaction rates and its limitations. The theory of absolute reaction rates (ARRT). Comparison of the collision theory with the absolute reaction rate theory. Lindemann theory of uni-molecular reactions.

UNIT- III**Kinetics of Photochemical Reactions**

Dark reactions - Complex thermal reactions- Thermal chain reaction - H_2/Br_2 reaction. Absorption of light and photochemical processes -Laws of photochemistry - BeerLambert law, The Stark-Einstein law of photochemical equivalence. Kinetics of photochemical chain reaction - H_2/Br_2 reaction.

Quantum yield of photochemical reactions. Comparison of the thermal and photochemical kinetics of the H_2 / Br_2 reaction. Photosensitized reactions -

photophysical process, Fluorescence, Phosphorescence and Chemiluminescence (definitions only).

UNIT- IV

Catalysis

Catalysis - types of catalysis - homogeneous catalysis - heterogeneous catalysis - Characteristics of catalytic reactions - Promoters - Catalytic poisoning - Auto catalysis - Negative catalysis - Activation energy and Catalysis - Theories of catalysis - Intermediate Compound Formation Theory, Adsorption Theory - Hydrogenation of ethylene in presence of Nickel - Acid-base catalysis - Enzyme catalysis - Mechanism of enzyme catalysis - Industrial applications of Catalysts.

UNIT- V

Colloids

Colloids - Definitions - types of colloids - sols - preparation, purification and properties - Kinetic, Optical and Electrical. Stability of colloids, gold number, associated colloids - Cleansing action of soaps and detergents. Emulsion - types of emulsions, preparation, properties and application, Gels - types of gels, preparation, properties and applications. Applications of colloids.

TEXT BOOKS

1. Arun Bahl and B. S. Bahl, G. D. Tuli, **Essentials of Physical Chemistry**, S. Chand & Co., Revised multicolor edition, 2012.
2. B. R. Puri, L. R. Sharma, and M. S. Pathania, **Principles of Physical Chemistry**, S. Chand & Co., New Delhi, 2009.
3. P. L. Soni, O. P. Dharmarha and U. N. Dash, **Textbook of Physical**

Chemistry, S. Chand & Co., New Delhi, 2013.

REFERENCE BOOKS

1. Keith J. Laidler and John H. Meiser, **Physical Chemistry**, CBS Publishers & Distributors, New Delhi, 2006.
2. Gurudeep Raj, **Advanced Physical Chemistry**, Goel Publishing House, Meerut, 2009.
3. K. K. Rohatgi Mukherjee, **Fundamentals of Photochemistry**, New age International Publishers, 2014.

17UCY63P	CORE CHEMISTRY PRACTICAL - III GRAVIMETRIC ANALYSIS AND INORGANIC PREPARATION	SEMESTER - VI
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Credits: 3

Hours per week: 3

I. Gravimetric Analysis

1. Estimation of Sulphate as Bariumsulphate.
2. Estimation of Barium as Barium Chromate.
3. Estimation of Lead as Lead Chromate.
4. Estimation of Calcium as Calcium Oxalate.
5. Estimation of Nickel as Nickel diethyglyoxime.

II. Preparation of Inorganic Complexes.

1. Tetra ammine copper (II) sulphate
2. Potassiumtrioxalatochromate (III)
3. Prussian blue
4. Hexamminecobalt (II) chloride
5. Hexathiourealead (II) nitrate
6. Trithiourea copper (I) sulphate

REFERENCE BOOKS

1. Venkateswaran.V, Veeraswamy. R, Kulandaivelu. A.R., **Basic Principles of Practical Chemistry**, 2nd Edition, New Delhi, Sultan Chand and Sons, (1997).
2. Mendham. J, Denney, R.C. Barnes. J.D and Thomas. M, **Vogel's Text book of Quantitative Analysis**, 6th Edition, Pearson Education, 1989.
3. Gopalan.R, Subramaniam P.S and Rengarajan. K, **Elements of Analytical Chemistry**, Sultan Chand and Sons, 2004.
4. Venkateswaran. V, Veeraswamy. R, Kulandaivelu . A.R, **Basic Principles of Practical Chemistry**, 2nd Edition, New Delhi, Sultan Chand and Sons, 1997.
5. G. Svehla, **Vogel's Qualitative Inorganic Analysis**, Orient Longman Ltd, Hyderabad, 1987.

17UCY63Q	CORE CHEMISTRY PRACTICAL - IV PHYSICAL CHEMISTRY EXPERIMENTS	SEMESTER - VI
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Credits:3**Hours per week: 3****I. Physical Chemistry Experiments**

1. Determination of Partition coefficient of Iodine between Carbon tetra chloride and water.
2. Determination of rate constant of acid-catalysed hydrolysis of an ester (Methyl acetate OR Ethyl acetate)
3. Determination of K_f / Molecular weight by Rast method (Naphthalene, Diphenyl and m-dinitrobenzene as solvents).
4. Determination of Critical solution temperature of Phenol-Water system.
5. Determination of concentration of an electrolyte (NaCl/ KCl/ Succinic acid)
6. Determination of Transition temperature of the hydrated salt (Sodium acetate, Sodium thio Sulphate and $\text{SrCl}_2 \cdot 6\text{H}_2\text{O}$)
7. Phase diagram-Simple Eutectic system
8. Determination of Cell Constant, Specific conductivity and Equivalent conductivity of strong electrolyte
9. Determination of dissociation constant of a weak acid (Acetic acid)
10. Conductometric Titration (Strong acid Vs Strong base)
11. Potentiometric Titration (Acid-Base Titration HCl Vs NaOH)
12. Potentiometric Titration (Redox Titration FAS Vs KMnO_4)
13. Estimation of Copper by colorimetric method
14. Estimation of Iron by colorimetric method.
15. Estimation of Manganese by colorimetric method.

REFERENCE BOOKS

1. Venkateswaran.V, Veeraswamy. R, Kulandaivelu. A.R., **Basic Principles of Practical Chemistry**, 2nd Edition, New Delhi, Sultan Chand and Sons, 1997.
2. Gopalan. R, Subramaniam. P.S., and Rengarajan, K., **Elements of Analytical Chemistry**, Sultan Chand and Sons, 2004.

17UCY63R	CORE CHEMISTRY PRACTICAL - V APPLICATION ORIENTED PRACTICAL	SEMESTER - VI
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Credits: 2**Hours per week: 4****I. Determination of Physical Constants.**

1. Determination of Melting point
2. Determination of Boiling point.

II. Preparation of Organic dyes

1. Preparation of dyes like Methyl Orange, Methyl Red, Azo Amino benzene

III. Preparation of Organic Compounds

1. Preparation involving Acetylation, Hydrolysis, Oxidation, Halogenation, Nitration and Benzoylation

IV. Preparation of Home care products

1. Preparation of white phenyl
2. Preparation of soap oil
3. Preparation of detergent powder
4. Preparation of transparent soap
5. Preparation of moisturizing cream

IV. Estimations

1. Estimation of Hardness of water using EDTA
2. Estimation of dissolved oxygen in water
3. Estimation of alkalinity in water
4. Estimation of calcium in limestone by EDTA method
5. Estimation of Total Fatty Matter (TFM) of a soap
6. Estimation of acid value of an oil
7. Estimation of available chlorine in bleaching powder

REFERENCE BOOKS

1. Venkateswaran. V, Veeraswamy. R, Kulandaivelu. A.R., **Basic Principles of Practical Chemistry**, 2nd Edition, New Delhi, Sultan Chand and Sons, 1997.
2. Mendham. J., Denney. R.C., Barnes. J.D. and Thomas, M. **Vogel's Text Book of Quantitative Analysis**, 6th Edition, Pearson Education.
3. Sharma, K.K. and Sharma, D.S. **Introduction to Practical Chemistry**, Vikas Publishing House, New Delhi, 2005.
4. Praveen Kukreja, **Chemistry Advanced Practical Manual**, Vrinda Publishing (p) Ltd, New Delhi, 2006.

17UCY6SA	SKILL BASED COURSE - IV TEXTILE CHEMISTRY	SEMESTER - VI
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PREAMBLE

- To understand the natural fibres, vegetable fibres, animal fibres, properties, to know about synthetic fibres , manufacture, properties, acquire knowledge about scouring and desizing, singeing processes, have a clear idea about latest bleaching techniques, have knowledge about dyeing- synthesis of dyestuffs and fastness properties

Course Outcomes

In the successful completion of the course, students will be able to

CO Number	Course Outcome Statement	Knowledge Level
CO1	To study the nature of fibers and its applications to materials.	K1, K2
CO2	To gain the knowledge on synthetic fibers and compare its application with natural fibers.	K1,K2
CO3	To experiment the preparatory process prior to dyeing.	K1,K2
CO4	Design a demonstration for the preparatory process of dyeing.	K2, K3
CO5	To develop the analytical ability to solve problems connected with textile technological processes.	K1, K2

MAPPING WITH PROGRAMME OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	S	S
CO2	M	S	S	S	S
CO3	S	S	S	S	S
CO4	M	M	S	S	S
CO5	M	M	S	S	S

S – Strong;

M - Medium;

L – Low

17UCY6SA	SKILL BASED COURSE - IV TEXTILE CHEMISTRY	SEMESTER - VI
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Credits:3**Hours per week: 3****UNIT - I****Vegetable Fibres And Animal Fibres**

Definition -classification of textile fibres- essential and desirable properties of textile fibres-Cotton fibre -Physical and Chemical properties, Jute - Purification; physical and chemical properties of jute, silk and wool.

UNIT - II**Regenerated And Synthetic Fibres**

Rayon -different types of rayon and their sources-manufacture of viscose rayon- physical and chemical properties- acetate rayon -manufacture - properties, cuprammonium rayon -manufacture and properties. Manufacture - properties and uses of polyamides- polyester-polypropylene and polyacrylonitrile.

UNIT - III**Preparatory Process Prior to Dyeing**

Scouring: Objective of scouring -process of caustic scouring on open kier machine with sine diagram, scouring with NaOH and Na₂CO₃ -Precautions to be taken before scouring. Desizing using malt extract-merits and demerits of acid and enzyme desizing. Singeing -Impurities present in grey cotton and cotton fabric -objects of singeing -process of singeing on gas singeing machine -precautions to be taken during gas singeing.

UNIT - IV

Principles of Bleaching

Principles of wetting and mechanism of detergency –synthetic detergents – surface active agents-bleaching processes –bleaching agents- H_2O_2 , NaOCl , bleaching powder and bio-bleaching and their properties-bleaching of cotton, rayon, wool and synthetic fibres.

UNIT - V

Principles of Dyeing

Colour and chemical constitution –Chromophore and auxochromes-natural and synthetic dyes-dyes –classification, synthesis of dye shift- congored, bismark brown and erifstal violet, theories of dyeing –effect of temperature and salt on dyeing –dyeing of wool, silk and poly-esters-dyeing of cotton with reactive dyes- fastness properties –washing, light, rubbing and perspiration.

TEXT BOOKS & REFERENCE BOOKS

1. Shenai. V.A.**Textile Fibres (Vol. I)**, Mahajan Publishers, Ahmedabad, 1991.
2. Shenai. V.A.,**Technology of Beaching**,Mahajan Publishers, Ahmedabad, 1998.
3. Shenai. V.A., **Chemistry of Dyes and Principles of Dyeing Vol. II**,Mahajan Publishers, Ahmedabad, 1991.
- 4.Gopalakrishnan. R.**Textile Fibres SSM**, Institute of Textile Technology, Mahajan Publishers, Ahmedabad, 1988.

17UCY5EA	ELECTIVE: I SPECTROSCOPY AND CHROMATOGRAPHY	SEMESTER - V
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PREAMBLE

- To enable the students to gain knowledge about the fundamentals of various spectroscopy, the basic principles and applications in Raman, UV -Visible, FT-IR, NMR and Mass spectroscopy.

COURSE OUTCOMES

In the successful completion of the course, students will be able to

CO Number	Course Outcome Statement	Knowledge Level
CO1	To understand the basic principles, instrumentation of UV-Visible spectroscopy and to utilize their basic aspects to identify various organic compounds.	K2, K3
CO2	Gain the knowledge in principles, instrumentation and functions of IR and Raman spectroscopy To compare and analyze the simple applications of IR and Raman spectroscopy.	K3
CO3	To study the basic principles and instrumentation of NMR spectroscopy and apply to predict the organic molecules.	K2, K3
CO4	To know about basic principles and instrumentation of mass spectroscopy technique and predict the fragmentation of simple molecules using rearrangement reactions.	K2, K3
CO5	Exploring the various chromatography techniques and their applications in separation of organic mixtures.	K2, K3

MAPPING WITH PROGRAMME OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	S	S
CO2	M	S	S	S	S
CO3	S	S	S	S	S
CO4	S	S	S	S	S
CO5	M	M	S	S	S

S - Strong;

M - Medium;

L - Low

17UCY5EA	ELECTIVE: I SPECTROSCOPY AND CHROMATOGRAPHY	SEMESTER - V
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**Credits:4 Hours
per week: 4**

UNIT - I

UV -Visible spectroscopy

Instrumentation- selection rules -Types of electronic transitions in organic molecules, Woodward Fieser rules for calculation of λ_{\max} of conjugated dienes, unsaturated carbonyl compounds. The chromophoric concept- auxochromes, absorption and intensity shifts- bathochromic, Hypsochromic, Hyperchromic, Hypochromic shifts. Types of absorption bands, solvent effects, Franck - Condon principle.

UNIT - II

Vibrational spectroscopy

IR spectra - Instrumentation-Theory of IR spectra for diatomic molecule as simple harmonic, and anharmonic oscillator, selection rule, vibrational frequencies - Vibrational modes of H₂O and CO₂. Finger print region, Applications of IR spectra – discuss.

Raman spectroscopy- Rayleigh and Raman scattering, Classical theory of Raman effect - Stokes and antistokes lines, instrumentation - block diagram – Rotation and vibration of raman spectrum- structure of CS₂ and N₂O. Mutual exclusion principle and its applications. Comparison of IR and Raman spectroscopy.

UNIT - III

NMR spectroscopy

NMR-principle, instrumentation, solvents used in NMR, conditions of resonance-relaxation process, spin-spin relaxation, spin-lattice relaxation-quadrupole relaxation. Number of signals- equivalent and non equivalent protons-position of signals-chemical shift-shielding and non shielding effects-factors influencing chemical shifts- peak area and proton coupling- splitting of signals in ethanol and chloromethane- spin-spin coupling- coupling constant. NMR spectra of simple molecules such as Acetone, Anisole, Benzaldehyde, Ethyl acetate, Ethylamine, Ethylbromide, Toluene and Isopropylphenyl ketone.

UNIT - IV

Mass Spectroscopy

Introduction - instrumentation - theory of mass spectrometry. Meta stable ions (or) peaks, molecular ion peak. Nitrogen rule-general fragmentation modes of hydrocarbons(cyclohexene, ethyl benzene and methyl propyl ketone) Retro-Diels Alder reaction. Hydrogen transfer rearrangements and McLafferty rearrangement.

UNIT -V

Chromatography

Paper chromatography - principle - solvents used - development of chromatogram- ascending, descending and radial paper chromatography - applications.

Thin layer chromatography - principle - choice of adsorbents and solvents, preparation of chromate plates- R_f values, factors affecting R_f values, Significance of R_f values.

Column Chromatography - principle - types of adsorbents, preparation of the column, elution, recovery of substances and applications.

TEXT BOOKS

1. Y.R Sharma, reprint 2009, **Elementary Organic Spectroscopy**, S.Chand & Co
2. B.R. Puri, L.R. Sharma, M.S. Pathania, 2010, **Principles of Physical chemistry**, Vishal Publications, 44th Edn.
3. Gurudeep R. Chatwal, **Instrumentation methods of chemical analysis**, Himalaya publishing house, New Delhi, 2002.

REFERENCE BOOKS

1. C.N. Banwell, E.M. McCash, 1995, **Fundamentals of Molecular Spectroscopy**, Tata Mcgraw Hill, 4th Edn
2. Jag Mohan, **Organic spectroscopy-principles and applications**, Narosa publishing house, 2013.
3. William Kemp, **Organic spectroscopy**, 3rd edition, palgrave publications, New York, 2008.

17UCY5EB	ELECTIVE: I AGRICULTURAL CHEMISTRY	SEMESTER - V	PR EA
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MBLE

➤ To understand the basic soil chemistry and the physical properties of soils, chemistry aspects of soil – nitrogen fixation and also to know the chemistry of pesticides, fungicides and herbicides.

COURSE OUTCOMES

In the successful completion of the course, students will be able to

CO Number	Course Outcome Statement	Knowledge Level
CO1	To understand the basics of soil chemistry, formation of soil and their importance in agriculture.	K2, K3
CO2	To study the physical properties of soil and their importance in the plant growth.	K1,K2, K3
CO3	To know the basic chemical aspects of soil and soil testing. To have depth of knowledge in nitrogen fixation of soils and bio conversion of agricultural wastes.	K1, K2, K3
CO4	To recognize the role of the plant nutrients in the growth of plant. To have an insight in the principles and classification of fertilizers.	K2,K3
CO5	To distinguish the properties, classification and mechanism of pesticides, fungicides and herbicides.	K2, K3

MAPPING WITH PROGRAMME OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	S	S
CO2	M	S	S	S	S
CO3	S	S	S	S	S
CO4	S	S	S	S	S
CO5	M	M	S	S	S

S – Strong;

M - Medium;

L – Low

17UCY5EB	ELECTIVE: I AGRICULTURAL CHEMISTRY	SEMESTER - V
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Hours per week: 4**UNIT - I****Origin of soil**

Definition of soil-origin-igneous-metamorphic and sedimentary rocks-rock systems-weathering of rocks and minerals- main components of soil-organic, inorganic, liquid and gaseous phase-Minerals of importance with respect to soil, industries and agriculture -Soil formation physical, chemical and biological factors responsible for soil formation-soil forming processes- Core soil groups of Tamilnadu-Soil survey standard soil survey-methods of soil surveys -remote sensing and soil mapping-soil resource management-use of satellite data for source inventory.

UNIT - II**Physical Properties of Soil**

Physical properties of soil-soil texture and textural classification-pore space-bulk density, particle density -soil structure and soil colour-surface area-soil colloids-plasticity, shrinkage-flocculation and deflocculation-soil air, soil temperature, their importance in plant growth-soil reaction -ion exchange reaction-cation exchange-anion exchange -buffering capacity - hydrogen ion concentration-determination of pH -factors affecting soil pH-soil pH and nutrient availability-Soil degradation -causes.

UNIT - III**Chemical Aspects of Soil**

Origin of problem soils, their properties acid, alkali and saline soils-diagnosis-

remediation of acid and salt effected soils –Methods of reaction and after care-
 Quality of irrigation water – causes for poor quality waters for irrigation, their
 effects in soil and crops. Soil testing-Concept,objective and basis-soil
 sampling, tools, collection processing, dispatch of soil and water samples. Soil
 organic matter-its decomposition and effect on soil fertility-source of organic
 matter in soil –maintenance and distribution –soil organism –their role-
 nitrification-denitrification, nitrogen fixation in soils-biological nitrogen
 fixation in soils –microbial interrelationship in soil-microbes in pert and
 disease management-Bio-conversion of agricultural wastes.

UNIT - IV

Plant Nutrients

Plant nutrients-macro and micro nutrients-their role in plant growth –sources-
 forms of nutrient absorbed by plants –factors affecting nutrient absorption-
 deficiency symptoms in plants-corrective measures-chemicals used for
 correcting nutritional deficiencies-nutrient requirements of crops, their
 availability, fixation and release of nutrients. Fertilizers –classification of NPK
 fertilizers –sources-natural and synthetic –straight –complex –liquid
 fertilizers, their properties, use and relative efficiency-secondary and micro
 nutrient fertilizers-mixed fertilizers –principles of fertilizers use –the efficient
 use of various fertilizers-integrated nutrient management biofertilizers –
 rhizobium, azospirillum, azotobactor-Blue green algae and azolla production
 and quality control of bio-fertilizers.

UNIT - V

Pesticides, Fungicides and Herbicides

Pesticides: Definition –classification –organic and inorganic pesticides-
 mechanism of action –Characteristics-Safe handling of pesticides –impact of

pesticides on soil, plants and environment –Acts and Laws concerning the pesticides-. Fungicides Definition –classification – mechanism of action- Sulphur, copper-mercury compounds, dithanes, dithiocarbamates. **Herbicides:** Definition –Classification-mechanism of action-Arsenic and boron compounds-nitro compounds, chloro compounds, Triazines, propionic acid derivatives, urea compounds. Acaricides-Rodenticides-Attractants-Repellants-Fumigants-defoliants.

TEXT BOOKS

1. Biswas, T.D and Mukherjee, S.K. **Textbook of Soil Science**, 1987.
2. Daji, A.J. **Textbook of Soil Sciences**, Asia Publishing House, Madras, 1970.
3. Tisdale. S. L., Nelson. W. L. and Beaton. J. D. **Soil Fertility and Fertilizers**, Macmillan Publishing Company, New York, 1990.

REFERENCE BOOKS

1. HESSE, A **Textbook of Soil Chemical Analysis** P.R. John Murray, 1971.
2. Buchel, K.H. John Wiley & Sons, **Chemistry of Pesticides**, New York, 1983.
3. Sree Ramula, **Chemistry of Insecticides and Fungicides Chemistry of Insecticides and Fungicides**, U.S. Oxford and IBH Publishing Co., New Delhi, 1979.

17UCY5EC	ELECTIVE: I PHARMACEUTICAL CHEMISTRY	SEMESTER - V
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PREAMBLE

➤ To know about the common diseases and cure-terms of pharmacology, to understand the mechanism of drug action, get introduced to chemotherapy - antibiotics, knowledge about various health promoting drugs.

Course Outcomes

In the successful completion of the course, students will be able to

CO Number	Course Outcome Statement	Knowledge Level
CO1	To know about the common diseases and terms involved in pharmacology.	K2, K3
CO2	To explore the availability of drugs, classification and their mode of action.	K3
CO3	To understand basic principles of physiological actions of drugs.	K3
CO4	Broadening the concepts of common body drugs.	K3
CO5	To have an insight on the health promoting drugs and their functions.	K2, K3

MAPPING WITH PROGRAMME OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	S	S
CO2	M	S	S	S	S
CO3	S	S	S	S	S
CO4	S	S	S	S	S
CO5	M	M	S	S	S

S - Strong;

M - Medium;

L - Low

	ELECTIVE: I PHARMACEUTICAL CHEMISTRY	SEMESTER - V
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Credits: 4**Hours per week: 4****UNIT- I****Introduction**

Common diseases -infective disease - insect - borne, air borne and water borne - hereditary diseases - Terminology- drug, pharmacology, pharmacognesy, pharmacodynamics, pharmacokinetics, anti metabolites - absorption of drugs-routes of administration of drugs, factors affecting absorption drugs-routes of administration of drugs, factors affecting absorption -Assay of drugs-chemical, biological, immunological assays, LD50 and ED50 therepeutic index, drug dosage.

UNIT - II**Drugs**

Various sources of drugs, pharmacologically active constitutents in plants, Indian medicinal plants-tulsi, neem, keezhanelli,- their importance- Classification of drugs- biological chemical-mechanism of drug action- Action at cellular and extra cellular sites. Drug receptors and biological responses- Metabolism of drugs through oxidation, reduction, hydrolysis and conjugate processes, factors affecting metabolism.

UNIT - III**Chemotherapy**

Designation of drugs based on physiological action; Definition and two examples each of Anaesthetics-General, IV and local- Analgesics - Narcotic and synthetic- Antipyretics and anti-inflammatory agents -Antibiotics - Penicillin, streptomycin, chloramphenicol, tetrecyclins- Antivirals, AIDS-symptoms, prevention, treatment- Cancer and neoplastic agents.

UNIT - IV

Common Body Ailments

Diabetes-Causes, hyper and hypoglycemic drugs- Blood pressure- Systolic & Diastolic Hypertensive drugs- Cardiovascular drugs- anti arrhythmic, anti anginals, vasodilators- CNS depressants and stimulants- Psychedelic drugs, hypnotics, sedatives (barbiturates, LSD)- Lipid profile -HDL, LDL cholesterol, lipid lowering drugs.

UNIT - V

Health Promoting Drugs

Nutraceuticals- Vitamins A, B, C, D, E and K micronutrients Na, K, Ca, Cu, Zn, I- Medicinally important inorganic compounds of Al, P, As, Hg, Fe - L examples for each, their role and applications- Organic Pharmaceutical acids, Agents for Kidney function (Aminohippuric acid), Agents for liver function (Sulfo bromophthalein), Agents for pituitary function (metyrapone)- Organic Pharmaceutical bases-anti oxidants, treatment of ulcer and skin diseases.

TEXT BOOKS

1. Jayashree Ghosh, **Pharmaceutical Chemistry**, S.Chand and Company Ltd., 2006, New Delhi.

REFERENCE BOOKS

1. Lakshmi S., **Pharmaceutical Chemistry**, S. Chand & Sons, New Delhi, 1995.
2. Ashutosh Kar, **Medicinal Chemistry**, Wiley Eastern Ltd., New Delhi, 1993.
3. David William & Thomas Lemke, **Principles of Medicinal Chemistry**, Foyers, 5th Edition BI publishers, 2005.
4. Romas Nogrady, **Medicinal Chemistry**, II Edition, Oxford Univ.Press., 2004.

17UCY5ED	ELECTIVE: II DYE CHEMSITRY	SEMESTER - V
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PREAMBLE

➤ To understand the basic concepts of dye chemistry, basic terms of dye chemistry, knowledge about classification of dyes, know the chemistry of pigments and preparation of dyes

COURSE OUTCOMES

In the successful completion of the course, students will be able to

CO Number	Course Outcome Statement	Knowledge Level
CO1	To understand the basic concepts of dye chemistry and their properties.	K1, K2
CO2	Broadening the concept of dyes and theory behind the color chemistry.	K2,K3
CO3	To distinguish the different types of dyes based on their classifications and applications.	K2,K3
CO4	To have an insight on the preparation and application of the dyes.	K2, K3
CO5	To understand the requirement of pigment and their applications in different fields.	K2, K3

MAPPING WITH PROGRAMME OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	S	S
CO2	M	S	S	S	S
CO3	S	S	S	S	S
CO4	M	M	S	S	S
CO5	M	M	S	S	S

S – Strong;

M - Medium;

L – Low

17UCY5ED	ELECTIVE: II DYE CHEMISTRY	SEMESTER - V
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Credits: 4**Hours per week: 4****UNIT- I****Introduction to the dyes**

Requisites of true dyes. Textiles fibres, Dyeing - ionic interaction, hydrogen bond vanderwalls interaction and covalent bonds. Basics operation in the dyeing process, various methods of dyeing - Direct, vat, mordant and disperse dyeing, formation of the dye on the fibre, dyeing of the wool with acid dyes and dyeing with reactive dyes. Fastness properties- colour, light, sublimation and burnt gas fumes fastness.

UNIT-II**Colour and constitution**

Colour and constitution - Relationship of colour observed to wave length of light observed - terms used in colour chemistry - Chromophores, Auxochromes, Bathochromic shift and Hypsochromic shift. Colour of a substance -quinonoid theory, molecular orbital theory.

UNIT- III**Classification of dyes**

Classification according to their applications - acid dyes, basic dyes, azoic dyes, mordant dyes, vat dyes, sulphur dyes and disperse dye.s. Azo dyes - principles governing azo coupling - mechanism of diazotisation - coupling with amines, coupling with phenols. Types of azo dyes -acidic azo dyes (methyl orange,metanil yellow), basic azo dyes (bismark brown,chrysodine G), direct dyes (congo red).

UNIT- IV**Preparation of dyes**

Synthesis and applications of Diphenyl methane dyes (Auramine O Auramine G) and Triphenyl methane dyes (Malachite green, pararosaniline, crystal violet), phthalein dyes (Phenolphthalein, Phthalein), Xanthene dyes (Fluorescein, Eosin), acridine dyes (Acridine Orange NO) ,sulphur dyes, Phthalocyanines, Cyanine dyes. (anyone dye in equation)

UNIT-V

Non-textile applications of dyes and pigments

Application of dyes in other areas- medicine, chemical analysis, cosmetics, colouring agents, food and beverages. Pigments – requirements of a pigment. Typical organic and inorganic pigments – applications and their uses in paints. Reaction of dyes with fibres and water – fluorescent brightening agents.

TEXT BOOKS

1. Gurdeep Chatwal , **Synthetic Dyes**, Himalaya Publishing House, New Delhi, 1990.
2. M.G.Arora, **Text Book of Dyes**, Anmol Publications Private Ltd. New Delhi, 1996.
3. B.K.Sharma , **Industrial chemistry**, 6th edition.

REFERENCE BOOKS

1. E.N. Abraham, **Dyes and Their Intermediates**, Bergamon Press, 1969.
2. H. A. Lubs, **The Chemistry of synthetic dyes and pigments**, ACS publication, Halner, 1970.
3. K.Venkataraman, **The Chemistry of Synthetic Dyes**, Vol.I, II, III & IV, Academic Press N.Y., 1949.
4. F. P. Schafer, **Physical and Chemical Applications of Dyestuffs**, Springer – Veriag N.Y., 1976.
5. I.L Finar, **Organic Chemistry**, Vol II, ELBS, 2009.

17UCY5EE	ELECTIVE: II NANO AND GREEN CHEMISTRY	SEMESTER - V
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PREAMBLE

➤ To understand the basics of nano chemistry, methods to prepare nano materials, an idea about Green Chemistry and its limitations, about Green solvents in laboratory and also in Industry, the Reactions and applications of Green Chemistry

COURSE OUTCOMES

In the successful completion of the course, students will be able to

CO Number	Course Outcome Statement	Knowledge Level
CO1	Gain knowledge in the basics of nano science and their classification. To apply the principles of nano science in carbon nanotubes.	K2,K3
CO2	To understand the few methods of preparation of nanomaterials based on chemical and photochemical methods.	K2, K3
CO3	To develop the basic knowledge of the various principles involved in green chemistry and their advantages.	K2, K3
CO4	To compare the green solvent-mediated reactions with traditional reactions.	K3
CO5	Analyze the applications of green solvent in various organic naming reactions.	K3

MAPPING WITH PROGRAMME OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	S	S
CO2	M	S	S	S	S
CO3	S	S	S	S	S
CO4	M	M	S	S	S
CO5	S	S	S	S	S

S –
Strong;

M –
Medium

m;

L – Low

17UCY5EE	ELECTIVE: II NANO AND GREEN CHEMISTRY	SEMESTER- V
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Credits: 4
Hours per week: 4

UNIT - I

Introduction to Nanoscience

Definition of Nanomaterials – classification (1D, 2D and 3D) with examples -
Synthesis top down and Bottom up Approach - Carbon Nanotubes – Types, properties and uses.

UNIT- II

Preparation of Nanomaterials.

Co-precipitation- sol- gel - chemical reduction- photochemical reduction –
hydrothermal and solvothermal synthesis.

Unit - III

Green Chemistry: Introduction-definition- Need for green chemistry- Goals -
Limitations – Progress of Green Chemistry - principles of green chemistry-
Concept of Atom economy- Concept of Selectivity.

Unit - IV

Green Solvents: Green solvents – super critical carbondioxide, ionic liquids -
Water as greener solvent- reactions in ionic-liquid, solvent free reaction.
Solvent less reaction – Microwave reactions – sonications.

Unit-V

Green Reactions: Green reactions- Aldol condensation (Acid catalyst, Crossed aldol), Claisen rearrangement, Clemmensen reduction, Diels-Alder reaction.

TEXT BOOKS

1. S. Shanmugam, **Nanotechnology**, M.J.P. Publishers, Chennai, 2010.
2. V. Kumar, **An Introduction to Green Chemistry**, Vishal Publishing Co., 2008.
3. V.K. Ahluwalia, **Green Chemistry**, Ane Books India, New Delhi, 2006.

REFERENCE BOOK

1. G. Cao, **Nanostructures & Nano Materials**, Imperial College Press, U.K, 2004.

17UCY5EF	ELECTIVE: II FORENSIC SCIENCE AND CRIME INVESTIGATION	SEMESTER -V
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PREAMBLE

- To give the students the importance of forensic chemistry and an exposure to find and analyse a suitable method to detect the crime.

COURSE OUTCOMES

In the successful completion of the course, students will be able to

CO Number	Course Outcome Statement	Knowledge Level
CO1	Demonstrate competency in the principles of crime scene investigation, including the recognition, collection, identification, preservation, and documentation of physical evidence.	K1, K2
CO2	Identify and examine the issues occurring during accidents, transportation of corrosive chemicals from tanks.	K2,K3
CO3	To acquire fundamental principles of physical and biological sciences. To apply scientific principles in gathering and interpreting scientific data.	K2,K3
CO4	To use their primary scientific literature effectively in their own research. To describe the scientific progress that has led to their research. To draw appropriate conclusions from evidence and experimental data.	K2, K3
CO5	To demonstrate the ability to document and orally describe crime scenes, physical evidence and scientific processes.	K2, K3

MAPPING WITH PROGRAMME OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	S	S
CO2	M	S	S	S	S
CO3	S	S	S	S	S
CO4	M	M	S	S	S
CO5	M	M	S	S	S

S - Strong;

M - Medium;

L - Low

17UCY5EF	ELECTIVE: II FORENSIC SCIENCE AND CRIME INVESTIGATION	SEMESTER- V
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Credits: 4
Hours per week: 4

UNIT - I Food Adulteration

Contamination of wheat, rice, dhal, milk, butter, etc. With clay, sand, stone, water and toxic chemicals (e.g. Kasserri dhal with mentanil yellow).

Food poisons: natural poisons (alkaloids, nephrotoxins), pesticides (DDT, BHC, Follidol), Chemical poisons (KCN). First aid and Antidotes for poisoned persons.

Heavy metal (Hg, Pb, Cd) Contamination of Sea food. Use of neutron activation analysis in detecting poisoning (e.g., As in human hair)

UNIT - II Transportation

Drunken driving: breath analyzer for ethanol. Incendiary and timed bombs in road and railway tracks. Defusing live bombs.

Hit -and-go traffic accidents : paint analysis by AAS. Soill of toxic and coorosivechemicals (e.g., conc.acids) from tankers.

UNIT - III Crime Detection

Accidental explosions during manufacture of matches and fire-works (as in Sivakasi). Human bombs, possible explosives (gelatin sticks,RDX). Metal detector devices and other security measures for VVIP. Composition of bullets and detection of powder burns.

Scene of crime: finger prints and their matching using computer records. Smell tracks and police dogs. Analysis of blood and other body fluids in rape cases. Typing of blood. DNA finger printing for tissue identification in

dismembered bodies. Blood stains on clothing. Cranial analysis (head and teeth).

UNIT - IV Forgery and Counterfeiting

Detecting forgery in bank cheques / drafts and educational records (mark lists, certificates), using UV-light. Alloy analysis using AAS to detect counterfeit coins. Checking silverline water mark in currency notes. Jewellery : detection of gold purity in 22 carat ornaments, detecting gold plated jewels, authenticity of diamonds (natural, synthetic, glassy).

UNIT - V Medical Aspects

AIDS : Cause and prevention . Misuse of scheduled drugs. Burns and their treatment by plastic surgery. Metabolite analysis, using mass spectrum - gas chromatography. Detecting steroid consumption among athletes and race horses.

REFERENCE BOOK

1. **Criminalistics and introduction to forensic science**-*Richard Saferstein, Prentice Hall of India-1978.*
2. **Forensic Science** -*T.H.James-Stanley Thornes ltd.1987*

17UCY6EA	ELECTIVE : III POLYMER CHEMISTRY	SEMESTER - VI
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PREAMBLE

➤ To impart knowledge about the preparation and properties of polymers of industrial importance and to know about the need as well as importance of polymer chemistry.

Course Outcomes

In the successful completion of the course, students will be able to

CO Number	Course Outcome Statement	Knowledge Level
CO1	To impart knowledge about the basics of polymers and their classification To differentiate the properties of plastics, elastomers and adhesives.	K2, K3
CO2	To have detail information on different types of polymerization.	K3
CO3	To acquire the detail conception in stereospecific polymers and their physical properties.	K3
CO4	To know about the utility and preparation of commercial polymers. To explore the application of biomedical polymers.	K3
CO5	To develop a deep knowledge on the polymerization and polymer processing techniques.	K2, K3

MAPPING WITH PROGRAMME OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	M	S	S
CO2	M	S	S	S	S
CO3	S	S	S	S	S
CO4	S	S	M	S	S
CO5	S	S	S	S	S

S - Strong;

M - Medium;

L - Low

17UCY6EA	ELECTIVE: III POLYMER CHEMISTRY	SEMESTER - VI
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Credits: 4
Hours per week: 4

UNIT - I

Polymers

Basic concepts such as monomers, polymers, polymerization, degree of polymerization, classification of polymers.

Plastics - Definition, thermoplastic, thermosetting plastics, reinforced plastic.

Elastomers, Spandex- Definition, natural and synthetic rubber, smoked rubber, reclaimed rubber, foam rubbers, spongy rubber, laminate rubber.

Adhesives- Definition, thermosetting and thermoplastic resins.

UNIT -II

Mechanism of polymerization

Types - Chain polymerization, Free radical polymerization, Ionic polymerization, Step polymerization, Addition polymerization. Co-polymerization - Conditions of formation of block, alternate and random copolymers. Methods of formation of block and graft copolymers.

UNIT - III

Polymer stereochemistry

Stereospecific polymers -Factors influencing stereo regulations, tacticity of polymers- Tactic, atactic and syndiotactic - Tactic forms of polymers of mono substituted and 1,2- disubstituted ethylenes, Zeigler-Natta catalysts, metallocene catalysts. Mono metallic and bimetallic mechanisms of Zeigler - Natta polymerization, crystalline and amorphous state, methods of determination of degree of crystallinity, glass transition temperature - Factors

influencing T_g - Determination of T_g - Glass transition temperature of copolymer, importance of T_g , - Visco elastic state - Properties of elastomers.

UNIT - IV

Chemistry of commercial polymers

General methods of preparations- properties and uses of the following polymers. Polyethylene, PVC, Polystyrene, Polyester, Phenol formaldehyde resin, Urea formaldehyde resin, Teflon, Nylon, polyamide (kevelar), Poly methyl methacrylate. Polymers for biomedical applications.

UNIT - V

Polymer technology

Polymerisation techniques: Bulk, solution, suspension and emulsion polymerization. Polymer processing techniques- calendaring, film casting, die casting, extrusion, compression moulding, injection moulding, blow moulding and foaming.

TEXT BOOKS

1. Arora M.G. Singh, Yadav M.S., **Polymer chemistry**, Anmol publications Pvt Ltd., New Delhi, 1989.
2. B.K.Sharma, **Polymer chemistry**, 1989
3. V.R. Gowariker, N.V.Viswanathan, Jayadev Sreedhar, 2005, **Polymer science**, New Age International Ltd.

REFERENCE BOOKS

1. Fred. W. Billmeyer, 2002, **Text book of polymer science**, Wiley Eastern ltd., 3rd Edn.

2. *Bahadur and N.V. Sastry, 2002, Principles of polymer science –Narosa Publishers, 1st Edn,*
3. *M.P. Stevens, 2009, Polymer chemistry- An Introduction, oxford publications, 3rd Edn*
4. *J.R. Fred, 2003, Polymer Science & Technology, Prentice Hall of India, 2nd Edn.*

17UCY6EB	ELECTIVE: III DAIRY CHEMISTRY	SEMESTER - VI
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PREAMBLE

- To gain knowledge about the chemistry of milk and milk products, to learn the principles and methods involved in the manufacture of milk products.

COURSE OUTCOMES

In the successful completion of the course, students will be able to

CO Number	Course Outcome Statement	Knowledge Level
CO1	To know the chemistry of milk and milk products	K3
CO2	To know the basics of milk proteins, milk lipids, milk carbohydrates, and milk vitamins.	K2,K3
CO3	Understanding the production and composition of milk products.	K2
CO4	By applying the acquired knowledge of dairy products, analyze the constituents of milk products.	K3
CO5	To deepen the knowledge in the various applications of milk products.	K3,K4

MAPPING WITH PROGRAMME OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	M	S	S
CO2	M	S	S	S	S
CO3	S	S	S	S	S
CO4	S	S	M	S	S
CO5	S	S	S	S	S

S - Strong;

M - Medium;

L - Low

17UCY6EB	ELECTIVE: III DAIRY CHEMISTRY	SEMESTER - VI
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Credits: 4**Hours per week: 4****UNIT - I**

Milk: Definition-General composition of milk-physical properties of milk-colour, odour, acidity-natural and developed, specific gravity-Recknagel effect viscosity and conductivity, factors affecting the gross composition of milk, physico-Chemical change taking place in milk due to processing parameters-boiling pasteurization- sterilization and homogenization.

Adulterants, preservatives and neutralizers-example and their detection. Estimation of fat, specific gravity, acidity and total solids in milk.

UNIT - II

Milk lipids-terminology and definitions classification – saponifiable (triglycerides) and unsaponifiable matters (sterols and cholesterol) phospholipids structure and properties (Lecithin and Cephalin) Milk fat constants-refractive index-saponification number, Iodine number, R.M.number, R.M number and polenske number.

Milk proteins-Chemistry of proteins in general structure-N-terminal and C-terminal, hydrogen bond, disulphide bond and salt linkages, outlines of primary, secondary and tertiary structure of proteins. Physical properties of milk proteins- Electrical properties and hydration, solubility. Reaction of milk proteins with formaldehyde and ninhydrin. Non-protein nitrogen constituents of milk, effect of heat on milk protein, milk enzyme and functions.

Milk carbohydrate-Lactose-Its structure, solubility, hydrolysis, Oxidation and reduction, Estimation of lactose in milk.

Milk vitamins-water and soluble vitamins, effect of heat and light on vitamins. Ash and mineral matters in milk.

UNIT - III

Creams - Definition-composition-chemistry of creaming process-gravitational and centrifugal methods of separation of cream-Factors influencing cream separation(Mention the factors only)-Cream neutralization. Estimation of fat in cream.

Butter - Definition-% composition-manufacture-Estimation of fat, acidity, salt and moisture content-Desi butter.

Ghee - Major constituents-common adulterants added to ghee and their detection rancidity- definition-types (hydrolytic, oxidative and ketonic) prevention- antioxidants and synergists (natural and synthetic)-Measurements.

UNIT - IV

Fermented milk products - Fermentation of milk-definition, conditions, cultured milk-definition of culture-examples, conditions, types-cultured cream-cultured butter milk-Bulgaricus milk-acidophillus milk-yogurt. Bacteriophage-definition and its function.

Indigenous products - Definition percentage composition-preparation-physicochemical changes take place during khoa-making-khoa sweet- Gulab jamun, chana sweet-Rosogolla-ingredients and preparation.

Ice cream - Definition-percentage composition-types-ingredients needed manufacture of ice-cream stabilizers-emulsifiers and their role.

UNIT - V

Milk powder - Definition-need for making powder-drying process-spray drying, drum drying, jet drying and foam drying-principles involved in each.

Manufacture of whole milk powder by spray drying process-keeping quality of milk powder.

Dairy Detergents - Definition-characteristics-classification-washing procedure(modern method) sterilization-chloramin-T and hypochlorite solution.

REFERENCE BOOKS

1. **Outlines of Dairy Technology**-*Sukumar De*
2. **Principles of Dairy Chemistry**-*Robert Jenness & S.Patarn.*
3. **Indian Dairy products**-*K.S. Rangappa and K.T. Achaya.*
4. **Modern Dairy Products**-*L.M. Lampert.*
5. **Principles of Dairy processing**-*Warner.*

17UCY6EC	ELECTIVE : III LEATHER CHEMISTRY	SEMESTER - VI	PR EA
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MBLE

- To gain knowledge about the structure and composition of hides, to learn the different methods of tanning leather, to understand the pollution problems caused by tannery effluents.

COURSE OUTCOMES

In the successful completion of the course, students will be able to

CO Number	Course Outcome Statement	Knowledge Level
CO1	To obtain the knowledge on the structure and composition of the hides, skin and Leather To know the basic principles involved in the pre-training methods of leather manufacture.	K2, K3
CO2	To know the different types of tanning and the physico-chemical principles.	K3
CO3	To widen a skill on the preparation and chemistry of chrome tanning liquids and their factors involving in it.	K3
CO4	To explore the broad idea on the chemical methods of curing and preserving the hides in different medium.	K3
CO5	To understand the problems caused by tannery effluents and to develop the method to dispose the tannery waste in safe manner.	K2, K3

MAPPING WITH PROGRAMME OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	M	S	S
CO2	M	S	S	S	S
CO3	S	S	S	S	S
CO4	S	S	M	S	S
CO5	S	S	S	S	S

S – Strong;

M - Medium;

L – Low

17UCY6EC	ELECTIVE: III LEATHER CHEMISTRY	SEMESTER - VI
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Credits:4 Hours per week: 4**UNIT - I**

Introduction-chief process used in leather manufacture. Hides, Skins, Leather – An elementary knowledge of the structure and composition of hides and skins. Proteins and their characteristics, Anatomy and histology of protein constituents of leather (an elementary concept). Basic principles involved in pre-tanning such as soaking, liming, deliming, bating, pickling and depickling.

UNIT - II

Types of tanning – vegetable and mineral tanning, different types of vegetable tanning–materials classification and chemistry of vegetable tanning. Factors and Physico-chemical principles involved in vegetable tanning, Fixation of vegetable tanning. Synthetic tanning – their classifications, general methods of manufacture and use.

UNIT - III

The preparation and chemistry of chrome tanning liquids, Oxolation, Oxolation and hydrolysis of chrome liquids. Effect of adding tanning agents – Role of pH in the reaction of chromium complexes with hide proteins. Factors governing chrome tanning- chemistry of neutralization process. A brief survey of chemistry of other tanning materials like Al, Zr and Te salts and their relative merit in contrast with chrome tanning. Chemistry of combination of tannages involving vegetable tanning aldehyde chrome and other tanning agents.

UNIT - IV

Chemical methods of curing and preservation of hides and skins in acid and alkaline solutions. Principles of Analytical methods employed in curing, liming, deliming, bating, pickling. Analysis of vegetable tanning materials and


extract. Process of dyeing leather – use of mordant, dyeing auxiliaries such as leveling, Wetting and dispersing agents – dye fixations.

UNIT - V

Animal by-products – their collection, handling and preservation methods (such as hair, blood, bones, glands, keratinous materials and their utilization). Tannery effluents and treatment: Types of water pollution – physical, chemical, physiological and biological. Different types of tannery effluents and waste- beam-house waste – liquors – tanning and finishing yard waste liquors, solid waste – origin and disposal.

TEXTBOOKS

1. B.K. Sharma, 2008, **Industrial chemistry**, Goel publishing House, Meerut.
2. Jayashree Ghosh, Reprint 2008, **Fundamental Concepts of Applied Chemistry**, S.Chand & Company Ltd
3. P.C.Jain, M.Jain, 2007, **Engineering Chemistry**, Dhanpat Raj Publishing Company Pvt Ltd, 15th Edn

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