ANNA ADARSH COLLEGE FOR WOWEN, CHENNAI

PG DEPARMENT OF CHEMISTRY

(For the academic year – 2021-2022)

PROGRAMME: B.Sc. CHEMISTRY

LIST OF STAFF MEMBERS

S.No	Name	Designation	Degree
1	Dr. S. Shanthi	Associate Professor	M.Sc., M.Phil., Ph.D
2	Dr. P. Shanthi	Associate Professor	M.Sc., M.Phil., Ph.D
3	Dr. T. Sobana Premlatha	Associate Professor	M.Sc., M.Phil., Ph.D., SLST
4	Dr. E. Thamaraiselvi	Assistant Professor	M.Sc., M.Phil., Ph.D., SLET
5	Ms. K. Priya Sudha	Assistant Professor	M.Sc., M.Phil (Ph.D)., SET
6	Dr. R. Vashantha	Assistant Professor	M.Sc., Ph.D
7	Dr. A. Sumita	Assistant Professor	M.Sc., SET., Ph.D
8	Dr. V. Sribharathy	Assistant Professor	M.Sc., M.Phil., Ph.D
9	Dr. K. Sangeetha	Assistant Professor	M.Sc., M.Phil., Ph.D
10	Dr. R.J. Kavitha	Assistant Professor	M.Sc., Ph.D
11	Dr. N.S. Sangeetha	Assistant Professor	M.Sc., M.Phil., Ph.D

PROGRAMME OUTCOMES

PO-1: B.Sc. Chemistry curriculum is so designed to provide the students a comprehensive understanding about the fundamentals of chemistry covering all the principles and perspectives.

PO-2: The branches of Chemistry such as Organic Chemistry, Inorganic Chemistry, Physical Chemistry and Analytical Chemistry expose the diversified aspects of chemistry where the students experience a broader outlook of the subject.

PO-3: The syllabi of the B.Sc. Chemistry course are discretely classified to give stepwise advancement of the subject knowledge right through the three years of the term.

PO-4: The practical exercises done in the laboratories impart the students the knowledge about various chemical reagents and reactions. Thereby, hone their skills of handling the corrosive, poisonous, explosive, and carcinogenic chemicals making themselves employable in any kind of chemical industries. They are also trained about the adverse effects of the obnoxious chemicals and the first aid treatment.

PROGRAMME SPECIFIC OUTCOMES

PSO-1: The students will understand the existence of matter in the universe as solids, liquids, and gases which are composed of molecules, atoms and subatomic particles.

PSO-2: Students will learn to estimate inorganic salt mixtures and organic compounds both qualitatively and quantitatively using the classical methods of analysis in practical classes.

PSO-3: Students will grasp the mechanisms of different types of reactions both organic and inorganic and will try to predict the products of unknown reactions.

PSO-4: Students will learn to synthesize the chemical compounds by manoeuvrings the addition of reagents under optimum reaction conditions.

PSO-5: The present course gives students ability to employ critical thinking and efficient problem - solving skills in the core areas of chemistry including analytical, Inorganic, organic and physical chemistry.

COURSE STRUCTURE

FIRST SEMESTER

Course Contents	Subjects	Inst. Hrs.	Credits	Exam Hrs.	Max. Marks		
					Ext. Marks	Int. Marks	Total
Part – I	Language – Paper – I	6	3	3	75	25	100
Part – II	BP2-ENG01-Communicative English I	3	3	3	50	50	100
Part - III	BCY-DSC01– General Chemistry-I	6	4	3	75	25	100
	Major Practical – I BCY-DSC05	2	-	3	Examination will be held in II semester		
	Allied Paper-I-Choose any one from the list	9	-	3	-	-	-
Part - I V	Basic Tamil/Adv. Tamil/NME*			3	50	50	100
	BP4-EPSC01-English for Physical Sciences I	-	2	3	75	25	100

***NME: Choose any one from the other department**

SECOND SEMESTER

Course Contents	Subjects	Inst. Hrs.	Credits	Exam Hrs.	Max. Marks		
					Ext. Marks	Int. Marks	Total
Part – I	Language – Paper – II	6	3	3	75	25	100
Part – II	BP2-ENG02-Communicative English II	3	3	3	50	50	100
Part - III	BCY-DSC02– General Chemistry-II	6	4	3	75	25	100
	Major Practical-I BCY-DSC05	2	-	3	60	40	100
	Allied Paper-I-Choose any one from the list	9	-	3	-	-	-
Part - I V	Basic Tamil/Adv. Tamil/NME*			3	50	50	100
	BP4-EPSC02-English for Physical Sciences II	-	2	3	75	25	100

LIST OF ALLIED PAPERS I & II

Course Contents	Subjects	Inst. Hrs.	Credits	Exam Hrs.	Max. Marks		
					Ext. Marks	Int. Marks	Total
Allied I	BMA-CSA01-Mathematics - I	6	5	3	75	25	100
Allied II	BMA-CSA02-Mathematics - II	6	5	3	75	25	100

THIRD SEMESTER

Course Contents	Subjects	Inst. Hrs.	Credits	Exam Hrs.	Max. Marks		
					Ext. Marks	Int. Marks	Total
Part – I	Language – Paper – II	6	3	3	75	25	100
Part – II	BP2-ENG03-Communicative English II	3	3	3	50	50	100
Part - III	BCY-DSC03– General Chemistry-III	6	4	3	75	25	100
	Major Practical-I BCY-DSC06	2	-	3	Examination will be held in II semester		
	Allied Paper-I-Choose any one from the list	9	-	3	-	-	-
Part - IV	BP4-EPSC03-English for Physical Sciences II	-	2	3	75	25	100

FOURTH SEMESTER

Course Contents	Subjects	Inst. Hrs.	Credits	Exam Hrs.	Max. Marks		
					Ext. Marks	Int. Marks	Total
Part – I	Language – Paper – II	6	3	3	75	25	100
Part – II	BP2-ENG04-Communicative English II	3	3	3	50	50	100
Part - III	BCY-DSC04– General Chemistry-IV	6	4	3	75	25	100
	Major Practical-I BCY-DSC06	2	-	3	Examination will be held in II semester		
	Allied Paper-I-Choose any one from the list	9	-	3	-	-	-
Part - IV	BP4-EPSC04-English for Physical Sciences II	-	2	3	75	25	100

FIFTH SEMESTER

Course Contents	Subjects	Inst. Hrs.	Credits	Exam Hrs.	Max. Marks		
					Ext. Marks	Int. Marks	Total
Part – III	Core Paper – VII – Inorganic Chemistry I	4	4	3	75	25	100
	Core Paper – VIII - Organic Chemistry I	4	4	3	75	25	100
	Core Paper – IX – Physical Chemistry I	4	4	3	75	25	100
	Core Paper – X - Gravimetric Analysis, (Practical-III)	3	3	Examination will be held in VI semester			
	Core Paper – XI - Organic analysis and preparation (Practical - IV)	3	3				
	Core Paper – XII Physical Chemistry (Practical-V)	3	3				
	Elective Paper – I (Pharmaceutical)	4	5	3	75	25	100
	Elective Paper – II (Polymer Chemistry)	4	5	3	75	25	100
Part - IV	Value Education	1	2	3	75	25	100

SIXTH SEMESTER

Course Contents	Subjects	Inst. Hrs.	Credits	Exam Hrs.	Max. Marks		
					Ext. Marks	Int. Marks	Total
Part – III	Core Paper – XIII – Inorganic Chemistry II	5	5	3	75	25	100
	Core Paper – XIV –Organic Chemistry II	5	5	3	75	25	100
	Core Paper – XV –Physical Chemistry II	5	5	3	75	25	100
	Core Paper–X Gravimetric Analysis (Practical-III)	3	3	3	60	40	100
	Core Paper – XI - Organic analysis and preparation (Practical - IV)	3	3	3	60	40	100
	Core Paper – XII Physical Chemistry (Practical-V)	3	3	3	60	40	100
	Elective Paper – III (Analytical Chemistry)	5	5	3	75	25	100
Part – I	Extension Activities	1	1				

FIRST SEMESTER

பொதுத்தமிழ் - முதலாமாண்டு - முதற்பருவம்
நோக்கும்கற்றல்பயன்பாடும் (2021 - 2022)

Objective - Syllabus - Out come (2021 -2022)

SEMESTER	Subject Title	Subject Code	Total Hours	Credit
I	பொதுத்தமிழ்	LA11A	60	3

பாடத்திட்டத்தின்நோக்கம்:

காலந்தோறும்தமிழ்அடைந்துள்ளவளர்ச்சியையும், இன்றையநவீனகாலத்தில் உருவானதமிழ்இலக்கியங்களையும்ஒற்றுமைவேற்றுமைப்படுத்திஆராய்கின்ற
நோக்கில்பொதுத்தமிழ்ப்பாடப்பகுதிகட்டமைக்கப்பட்டுள்ளது.
பாரதியார், பாரதிதாசன், கவிமணிஉள்ளிட்டோரின்மரபுக்கவிதைகளும், அப்துல்
ரகுமான், சிற்பி, மு.மேத்தா, வைரமுத்துஉள்ளிட்டோரின்புதுக்கவிதைகளும்
இரா.பி.சுதுப்பிள்ளைஅவர்களின்உரைநடை, முத்துசாமிஅவர்களின்நாடகம்
போன்றவைஇடம்பெற்றுள்ளன.
தமிழ்மக்களின்வாய்மொழிஇலக்கியங்களில்சிலபாடல்கள்பாடமாக
வைக்கப்பட்டுள்ளன.
இந்தஇலக்கியங்கள்சார்ந்தவரலாற்றுப்பின்புலமும்பாடமாகஅமைந்துள்ளன.
மாணவர்களுக்குப்படிப்பின்ஆர்வத்தைத்தூண்டும்வகையில்கவிதைகள், சிறுகதை, உரைநடை, நாடகம்போன்றஎளிமையானபகுதிகள்அமைக்கப்பட்டுள்ளன.

இலக்கியவாசிப்பின்ஆர்வத்தைஊக்குவித்தலும்தற்காலதமிழ்இலக்கியத்தின் ஆளுமைகளைமாணவர்கள்புரிந்துகொள்ளவைத்தலும்பாடத்திட்டத்தின்நோக்கமாகும்.
தமிழ்இலக்கியவரலாற்றில்தற்காலபடைப்பாளர்களையும்படைப்புகளையும் அறிமுகப்படுத்தித்தமிழ்இலக்கியப்பாரம்பரியத்தைப்புரியவைத்தலும்பிழையின்றி
எழுதுவதற்குரியஇலக்கணவிதிமுறைகளைத்தெரிந்துகொள்ளுதலும்பாடத்திட்டத்தின்நோக்கமாகும்.

தமிழ்மொழியின்கடினமானசொற்களுக்குரியபொருளைத்தெரிந்துகொள்ளும் வகையில்அகராதியைப்பயன்படுத்துவதற்குரியஅடிப்படையைக்கற்றுத்தருதலேநோக்கமாகும்.

பாடத்திட்டம்
பாடப்பகுப்பு

I. இலக்கியம்
II. அதைச்சார்ந்ததமிழிலக்கியவரலாறு
III. மொழிப்பயிற்சி

அலகு - 1
மரபுக்கவிதை

1. பாரதியார் - பாரதசமுதாயம்.
2. பாரதிதாசன் - ஒற்றுமைப்பாட்டு
3. கவிமணிதேசிகவிநாயகம்பிள்ளை - உடல்நலம்பேணல்
4. நாமக்கல்கவிஞர்வெ. இராமலிங்கம்பிள்ளை - தமிழன்இதயம்
5. கவிஞர்கண்ணதாசன் - குடும்பம்ஒருகதம்பம்
6. பட்டுக்கோட்டைஅ. கல்யாணசுந்தரம் - வருங்காலம்உண்டு
7. தமிழ்ஒளி - வழிப்பயணம்

புதுக்கவிதை

1. கவிஞர்ந. பிச்சமூர்த்தி - காதல்
2. கவிஞர்அப்துல்ரகுமான் - பித்தன்
3.கவிஞர்மு.மேத்தா - காதலர்பாதை, ஒருகடிதம்அனாதையாகிவிட்டது, நிழல்கள்
4. கவிஞர்இன்குலாப் - ஒவ்வொருபுல்லையும்பெயர்சொல்லிஅழைப்பேன்
5. கவிஞர்தமிழன்பன் - சொல்லில்உயர்வுதமிழ்ச்சொல்லே
6. கவிஞர்வைரமுத்து - விதைச்சோளம்
7. கவிஞர்அ.சங்கரி - இன்றுநான்பெரியபெண்

அலகு - 2
நாட்டுப்புறஇலக்கியம்

1. ஏற்றப்பாட்டு
2. தெம்மாங்கு
3. அம்பாபாடல்கள்
4. விளையாட்டுப்பாடல்கள்
5. நடவுப்பாடல்கள்

அலகு - 3

சிறுகதைகள்

1. கு.ப.ரா- கனகாம்பரம்
2. கு.அழகிரிசாமி - குமாரபுரம்ஸ்டேஷன்
3. தமிழ்ச்செல்வன் - வெயிலோடுபோய்
4.தோப்பில்முகமதுமீரான் - வட்டக்கண்ணாடி
5.அம்பை - பிளாஸ்டிக்டப்பாவில்பராசக்திமுதலியோர்

உரைநடை

1.இரா.பி.சேதுப்பிள்ளை - வண்மையும்வறுமையும்

அலகு - 4

நாடகம்

நா.முத்துசாமி - நாற்காலிக்காரர்

அலகு -5

தமிழிலக்கியவரலாறு

1. மரபுக்கவிதை - இருபதாம்நூற்றாண்டுகவிஞர்கள்

2. புதுக்கவிதை - தோற்றம் - வளர்ச்சி -வரலாறு

3. நாட்டுப்புறப்பாடல்கள், கதைகள், கதைப்பாடல்கள், பழமொழிகள், விடுகதைகள்

- வரலாறு

4. சிறுகதை, உரைநடைவரலாறு

5. நாடகம் - வரலாறு

அலகு - 6

மொழிப்பயிற்சி

1. வாக்கியவகை(தொடர்வாக்கியம், தனிவாக்கியம், கூட்டுவாக்கியம்)

2. இருவழக்குகள் (பேச்சு, எழுத்து)

3. எழுவாய், பயனிலை, செயப்படுபொருள்

4. ஒருமை, பன்மைமயக்கம்

5. திணை, பால், எண், இடவேறுபாடு

6. நால்வகைச்சொற்கள் (பெயர், வினை, இடை, உரி)

7. அகரவரிசைப்படுத்துதல்

கற்றலும்பயன்பாடும்:

தமிழ்மொழியின்இலக்கியவளங்களின்மதிப்பைப்புரிதல். தமிழ்இலக்கிய வாசிப்பின்வழிசமூகவிழிப்புணர்வைத்தூண்டுதல்.

தமிழ்இலக்கியவளங்களின் வாயிலாகத்தமிழ்ப்பண்பாட்டைஅடுத்ததலைமுறைக்குக்கொண்டுசெல்லுதல். மொழிவளத்தின்தேவையைவலியுறுத்துதல். மாணவர்கள்பிழையின்றிஎழுத மொழிப்பயிற்சிஉதவுகிறது.

இப்பாடத்திட்டம்மாணவர்கள்தங்கள்படைப்புகளைஉருவாக்குவதற்கும் பயன்படுகிறது.

போட்டித்தேர்வுகளைஎதிர்கொள்ளுவதற்குரியவகையில்இலக்கிய வரலாற்றுப்பகுதிமிகுந்தபயனுடையதாய்உள்ளது.

FRENCH SYLLABUS WITH EFFECT FROM (2020-2021)

Common to all B.A / B.sc / B.com courses

SEMESTER I	Subject Title	Subject Code	Total Hours	Credit
	PRESCRIBED TEXT AND GRAMMAR-I	**CLK1S**	**60**	**3**

LEARNING OBJECTIVES

In teaching French we aim to-provide the learners with a basic knowledge of grammar and gradually give them an insight into the culture and literature of France-enable them to comprehend the nuances of the language so they are better equipped to express themselves in French-discover another world, another people , another way of life .-make them more accepting of people who differ from them prescribed textbook:> Régine Mérieux & amp; Yves Loiseau, LATITUDES 1, PARIS, DIDIER, 2017 (UNITS 1-6 ONLY).

UNITÉ 1 - SALUT!

Saluer - entreren contact avec quelqu'un - se présenter- s'excuser

UNITÉ 2 - ENCHANTÉ !

Demander de se présenter - Présenterquelqu'un

UNITÉ 3 - J'ADORE !

Exprimersesgoûts - Échanger sur sesprojets

UNITÉ 4 - TU VEUXBIEN ?

Demander à quelqu'un de faire quelque chose - Demander poliment - Parlerd'actionspassées

UNITÉ 5 - ON SE VOITQUAND ?

Proposer , accepter, refuser une invitation. - Indiquer la date - Prendre et fixer un rendez-vous - Demander et indiquerl'heure

UNITÉ 6 - BONNE IDÉE !

Exprimer son point de vuepositif et négatif - S'informer sur le prix - S'informer sur la quantité - Exprimer la quantité .

FOUNDATION COURSE IN HINDI

SEMESTER I	Subject Title	Subject Code	Total Hours	Credit
	FOUNDATION COURSE IN HINDI	**CLE1E**	**60**	**3**

COURSE OBJECTIVES:

1. The objective of the course is to sensitize the students -
2. To the aesthetic and cultural aspects of literary appreciation and analysis.
3. To introduce modern Hindi Prose to the students and to understand the cultural,
4. social and moral values of modern Hindi Prose.
5. To familiarize Official correspondence, General letter correspondence and technical words.
6. To motivate to demonstrate human value in different life situations

COURSE OUTCOMES:

1. Understanding the concept and importance of functional Hindi
2. Understanding various forms of functional Hindi and its usage according to its area of
3. application
4. Knowledge about good civilization qualities and culture.
5. Knowledge about the importance of human values.

UNIT-I

1. Sabhyata ka Rahasya

2. Personal Applications

3. Leave Letters

4. Government Order

5. Administrative Terminology Hindi to English (25 Words)

UNIT - II

1. Mitrata

2. Letter to the Editor

3. Opening an A/C

4. Demi Official Letter

5. Administrative Terminology **English to Hindi (25 Words)**

UNIT-III

1. Yuvavon Se

2. Application for Withdrawal

3. Circular

4. Memo

5. Administrative Terminology Hindi to English **(** 25 Words **)**

UNIT-IV

1. Paramanu Oorja evam Khadya Padarth Sanrakshan

2. Transfer of an A/C

3. Missing of Pass Book / Cheque Leaf

4. Official Memo

5. Administrative Terminology English to Hindi (25 Words)

UNIT-V

1. Yougyata aur Vyavasay ka Chunav

2. Complaints

3. Ordering for Books

4. Notification

5. Official Noting Hindi to English (25 words)

UNIT-VI

1. Enquiry

2. Resolution

3. Notice

4. Official Noting English to Hindi (25 words)

REFERENCE :

1. KaryalayeenTippaniya :Kendriya Hindi Sansthan, Agra
2. PrayojanMoolakHindi :Dr. Syed Rahamathulla, Poornima Prakashan
   4/7, Begum III Street, Royapettah, Chennai – 14.

COMMUNICATIVE ENGLISH

Semester 1

SEMESTER I	Subject Title	Subject Code	Total Hours	Credit
	COMMUNICATIVE ENGLISH-I	**LZ11A**	**60**	**3**

COURSE OBJECTIVES:

1. To give English language skill practice to students to enhance their English proficiency.
2. To expose students to native speakers‟ spoken language to enable students to recognize native speakers‟ accent and language usage.
3. To simulate real life situations in the classroom to practice real English dialogues and speeches to gain English language fluency.
4. To give both silent and loud reading practice to students, to enhance their comprehension and English sound recognition skills
5. To help students overcome their fear and to speak in English in front of their peers and teachers thus, build their self-confidence through various classroom activities and outdoor activities.

COURSE OUTCOMES:

1. The course seeks to develop the students' abilities in grammar, oral skills, reading, writing and study skills.
2. Students will heighten their awareness of correct usage of English grammar in writing and speaking.
3. Students will improve their speaking ability in English both in terms of fluency and comprehensibility.
4. Students will give oral presentations and receive feedback on their performance.
5. Students will increase their reading speed and comprehension of academic articles.
6. Students will improve their reading fluency skills through extensive reading.

SYLLABUS:

UNIT I

Listening and Speaking

a. Introducing self and others

b. Listening for specific information

c. Pronunciation (without phonetic symbols)

i. Essentials of pronunciation

ii. American and British pronunciation

2. Reading and Writing

a. Reading short articles – newspaper reports / fact based articles

i. Skimming and scanning

ii. Diction and tone

iii. Identifying topic sentences

b. Reading aloud: Reading an article/report

c. Journal (Diary) Writing

3. Study Skills - 1

a. Using dictionaries, encyclopaedias, thesaurus

4. Grammar in Context:

Naming and Describing

Nouns & Pronouns

Adjectives

UNIT II

1. Listening and Speaking

a. Listening with a Purpose

b. Effective Listening

c. Tonal Variation

d. Listening for Information

e. Asking for Information

f. Giving Information

2. Reading and Writing

1. a. Strategies of Reading:

Skimming and Scanning

b. Types of Reading

Extensive and Intensive Reading

c. Reading a prose passage

d. Reading a poem

e. Reading a short story

2. Paragraphs: Structure and Types

a. What is a Paragraph?

b. Paragraph structure

c. Topic Sentence

d. Unity

e. Coherence

f. Connections between Ideas: Using Transitional words and expressions

g. Types of Paragraphs

3. Study Skills II:

Using the Internet as a Resource

a. Online search

b. Know the keyword

c. Refine your search

d. Guidelines for using the Resources

e. e-learning resources of Government

of India

f. Terms to know

4. Grammar in Context

Involving Action-I

a. Verbs

Concord

UNIT III

1. Listening and Speaking

a. Giving and following instructions

b. Asking for and giving directions

c. Continuing discussions with connecting ideas

2. Reading and writing

a. Reading feature articles (from newspapers and magazines)

b. Reading to identify point of view and perspective (opinion pieces,

editorials etc.)

c. Descriptive writing – writing a short descriptive essay of two to three

paragraphs.

3. Grammar in Context:

Involving Action – II

Verbals - Gerund, Participle, Infinitive

Modals

UNIT IV

1. Listening and Speaking

a. Giving and responding to opinions

2. Reading and writing

a. Note taking

b. Narrative writing – writing narrative essays of two to three

paragraphs

3. Grammar in Context:

Tense

Present

Past

Future

UNIT V

1. Listening and Speaking

a. Participating in a Group Discussion

2. Reading and writing

a. Reading diagrammatic information

– interpretations maps, graphs and pie charts

b. Writing short essays using the language of comparison and

contrast

Grammar in Context: Voice (showing the relationship between Tense

and Voice)

SEMESTER I	Subject Title	Subject Code	Total Hours	Credit
	PROFESSIONAL ENGLISH- I	PZ1SA	30	2

COURSE OBJECTIVES:

1. To develop the language skills of students by offering adequate practice in professional contexts.
2. To enhance the lexical, grammatical, and socio-linguistic and communicative competence of first year students.
3. To focus on developing students' knowledge of domain specific registers and the required language skills.
4. To develop strategic competence that will help in efficient communication

LEARNING OUTCOMES:

1. Recognise their own ability to improve their own competence in using the language
2. Use language for speaking with confidence in an intelligible and acceptable manner
3. Understand the importance of reading for life
4. Read independently unfamiliar texts with comprehension
5. Understand the importance of writing in academic life
6. Write simple sentences without committing error of spelling or grammar (Outcomes based on guidelines in UGC LOCF – Generic Elective)
7. NB: All four skills are taught based on texts/passages

SYLLABUS:

UNIT 1: COMMUNICATION LISTENING:

Listening to audio text and answering questions - Listening to Instructions Speaking: Pair work and small group work. Reading: Comprehension passages –Differentiate between facts and opinion Writing: Developing a story with pictures. Vocabulary: Register specific - Incorporated into the LSRW tasks

UNIT 2: DESCRIPTION LISTENING:

Listening to process description -Drawing a flow chart. Speaking: Role play (formal context) Reading: Skimming/Scanning- Reading passages on products, equipment and gadgets. Writing: Process Description –Compare and Contrast Paragraph-Sentence Definition and Extended definition- Free Writing. Vocabulary: Register specific -Incorporated into the LSRW tasks.

UNIT 3: NEGOTIATION STRATEGIES

Listening: Listening to interviews of specialists / Inventors in fields (Subject specific) Speaking: Brainstorming. (Mind mapping). Small group discussions (Subject- Specific) Reading: Longer Reading text. Writing: Essay Writing (250 words) Vocabulary: Register specific - Incorporated into the LSRW tasks

UNIT 4: PRESENTATION SKILLS LISTENING:

Listening to lectures. Speaking: Short talks. Reading: Reading Comprehension passages Writing: Writing Recommendations Interpreting Visuals inputs Vocabulary: Register specific - Incorporated into the LSRW tasks

UNIT 5: CRITICAL THINKING SKILLS LISTENING:

Listening comprehension- Listening for information. Speaking: Making presentations (with PPT-practice). Reading: Comprehension passages –Note making. Comprehension: Motivational article on Professional Competence, Professional Ethics and Life Skills) Writing: Problem and Solution essay– Creative writing –Summary writing Vocabulary: Register specific - Incorporated into the LSRW tasks

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CORE PAPER I – GENERAL CHEMISTRY I

SEMESTER	Subject Title	Subject Code	Total Hours	Credit
I	CORE PAPER- I -GENERAL CHEMISTRY - I	SD21A	75	4

LEARNING OBJECTIVES:

- To know the fundamental concepts of atomic structure and basics of quantum mechanics.
- To know the periodicity of properties of elements.
- To understand the various types of chemical bonding and basics of solid state.
- To learn the principles of inorganic qualitative and quantitative analysis.
- To understand the basic concepts of nanotechnology
- To understand the basic concepts of organic chemistry.

LEARNING OUTCOMES:

- The concept of atomic structure such as photoelectric, Compton Effect and postulates of quantum mechanics was explained. The exclusion, Aufbau principle and slater's rule and Hund's application and limitation were discussed, and the students understood well.
- The learner understands the classification of elements and the modern periodic table and its properties. Students learned about the variation of period and group of elements along with its metallic characters in detail.
- Students are able to do hybridization of molecules and understand the reactive intermediates and their formation and stability. Nomenclatures of organic compounds are understood in detail by the students.
- The concept of chemical bonding learners understands the ionic and covalent bond characteristics were introduced.
- The students understand the principle of Inorganic Qualitative and Quantitative Analysis.
- Students could correlate the principles of volumetric analysis with titration experiments during practical classes.

UNIT - I

ATOMIC STRUCTURE AND INTRODUCTION TO QUANTUM MECHANICS (15 hrs)

Rutherford's atomic model, Planck's quantum theory of radiation, Photoelectric effect, Bohr's theory of hydrogen atom - postulates, Bohr's radius, energy of electron, origin of hydrogen spectrum. Particle and wave nature of electron - de Broglie's equation, Heisenberg's uncertainty principle and Compton effect - Schrodinger wave equation (no derivation) - Significance of Ψ and Ψ2 - Wave mechanical concept of atomic orbitals, - Shapes of orbitals - Quantum numbers - Zeeman effect, Pauli`s exclusion principle, Aufbau principle - Effective nuclear charge, screening effect, Slater's rules -applications and limitations. Electronic

configuration of first 30 elements - extra stability of half-filled and completely filled orbitals. Hund's rule - its basis and applications.

UNIT - II

CLASSIFICATION OF ELEMENTS AND PERIODICITY OF PROPERTIES (10 hrs)

Classification of elements - noble gases and s, p, d and f - block elements. Modern periodic table. Position of hydrogen in the periodic table-Variation of atomic volume, atomic and ionic radii, ionization potential, electron affinity, electronegativity along periods and groups-variation of metallic characters-factors influencing the above periodic properties.

UNIT - III

3.1 CHEMICAL BONDING (15hrs)

Ionic bond - factors influencing the formation of ionic compounds - ionisation energy, electron affinity and lattice energy; inert pair effect, Fajan's rules. Covalent bond - polarity of covalent bond, percentage ionic character of covalent bond, dipole moment and molecular structures of CO_2, H_2O, NH_3 and CH_4 , bond characteristics - bond length, bond angle and bond energy.

3.2 SOLID STATE

Classification of solids, isotropic and anisotropic crystals, representation of planes, Miller indices, space lattice, unit cell, crystal systems. X-ray diffraction-derivation of Bragg's equation, discussion of structures of NaCl, CsCl and ZnS, determination of Avogadro's number.

UNIT - IV PRINCIPLES OF INORGANIC QUALITATIVE AND QUANTITATIVE ANALYSIS (10 hrs)

Common ion effect, solubility product, applications of the solubility product principle in qualitative analysis. Principle of elimination of interfering anions. Complexation reactions in qualitative analysis. Spot test reagents and tests with them - Cupferon, DMG, thiourea, magneson, alizarin and Nessler reagent. Volumetric analysis - Definitions - normality, molarity, molality and molefraction, primary and secondary standards, theories of acid - base, redox, complexometric, iodometric and iodimetric titrations, calculations of equivalent weights, theories of acid - base, redox, metal ion and adsorption indicators and choice of indicators. Nanotechnology(10Hrs) Introduction to nano science and nanotechnology – Types of nanoparticles, Techniques to synthesize nanoparticles, Physical methods – Physical vapour deposition (evaporation and sputtering) – chemical methods–reduction methods – sol–gel methods

UNIT - V

BASIC CONCEPTS OF ORGANIC CHEMISTRY (15 hrs)

Hybridisation and shapes of molecules - methane, ethane, ethylene, acetylene and benzene. Electron displacement effects - inductive, electromeric, mesomeric (resonance) and hyperconjugation. Steric effect. Cleavage of bonds - homolytic and heterolytic fissions. Reactive intermediates - carbocations, carbanions and free radicals - their formation and stability.

Nomenclature of organic compounds: IUPAC system of nomenclature of compounds containing upto 8 carbon atoms - mono and bifunctional compounds.

TEXT BOOKS :

1. Puri B.R., Sharma L.R. and Pathania M.S., Principles of Physical Chemistry, 47th ed., New Delhi, Vishal Publishing Co.,2016.

2. Puri B.R., Sharma L.R. and Kalia K.C., Principles of Inorganic Chemistry, 33th ed., New Delhi, Milestone Publishers and Distributors,2016.

3. Soni P.L., and Chawla H.M., Textbook of Organic Chemistry, 29th ed., New Delhi, Sultan Chand & Sons, 2007.

4. T. Pradeep, Nano: The Essentials, New Delhi, McGraw Hill,2007

5. H.M., Textbook of Organic Chemistry, 29th ed., New Delhi, Sultan Chand & Sons,2007.

6. Fundamentals of Crystal Chemistry, T R N Kutty;J A K Tareen, Universities Press Private Limited, Chennai, 2000

7. Basic Course in Crystallography, A, J A K Tareen;T RN Kutty, Universities Press Private Limited, Chennai, 2000

REFERENCE BOOKS

1. Jain M.K, Sharma S.C. Modern Organic Chemistry, Vishal Publishing Co.,2017

2. Lee J.D. Concise Inorganic Chemistry, 5th ed., Blackwell Science,2005.

3. Soni, P.L. and Mohan Katyal. Textbook of Inorganic Chemistry, 20th ed., Sultan Chand & Sons, 2006.

4. Glasstone Samuel. Textbook of Physical Chemistry, 2nd ed., Macmillan India Ltd.,1990. 5. Soni P.L., Dharmarha O.P. and Dash U.N Textbook of Physical Chemistry, 23rd ed., New Delhi, Sultan Chand & Sons,2011.

6. Graham Solomons T.W. Organic Chemistry, 3rd ed., John Wiley &Sons.

7. Morrison R.T. and Boyd R.N., Organic Chemistry, 6th ed., Pearson Education, Asia,2002.

8. C. N. R. Rao, Chemistry of Nanomaterials: Synthesis, Properties and Applications, Wiley-VCH Verlag GmbH & Co. Kgaa,2004

9. Charles P. Poole Jr., Frank J. Owens, Introduction to Nanotechnology, New Jersey, John Wiley & Sons, 2003.

MATHEMATICS –I

(Effective from the Academic Year 2020-2021)

SEMESTER	Subject Title	Subject Code	Total Hours	Credit
I	**Core Paper- I -MATHEMATICS –I**	**SM3AA**	**75**	**5**

COURSE OBJECTIVES:

- To enable students to learn basic concepts of Algebra and Numerical methods.
- To enable students to understand Matrices and Theory of equations.
- To learn circular, hyperbolic and inverse hyperbolic functions and to understand differential calculus and its applications.

COURSE OUTCOMES:

- Student gain knowledge to find the summation of series and to solve problems in Numerical methods.
- Student will be able to find the Eigen values, Eigen vectors, apply Cayley Hamilton
- Theorem to find inverse of a Matrix, Powers of a Matrix and to solve polynomial equations.
- Student will be able to evaluate circular, Hyperbolic, inverse hyperbolic functions and to
- Find higher derivatives of functions and its applications.

UNIT 1 ALGEBRA AND NUMERICAL METHODS:

Algebra: Summation of series - simple problems.

Numerical Methods: Operators E,□,∇, difference tables- Newton-Raphson method- Newton's forward and backward interpolation formulae for equal intervals, Lagrange's interpolation formula.

Chapter 2, Section 2.1.3, 2.2, 2.2.1, 2.3, 2.3.3

Chapter 3, Section 3.4.1 and Chapter 5, Section 5.1 and 5.2.

UNIT 2 MATRICES:

Symmetric, Skew-Symmetric, Orthogonal, Hermetian, Skew-Hermetian and

Unitary matrices. Eigen values and Eigen-vectors, Cayley-Hamilton theorem (without proof)

– verification- Computation of inverse of matrix using Cayley - Hamilton theorem.

Chapter 4, Section 4.1.1 to 4.1.6, 4.5, 4.5.2, 4.5.3.

UNIT 3 THEORY OF EQUATIONS:

Polynomial equations with real coefficients, irrational roots, complex roots, symmetric functions of roots, transformation of equation by increasing or decreasing roots by a constant, reciprocal equation-simple problems.

Chapter 3, Section 3.1 to 3.4.1(omit section 3.2.1)

UNIT 4 TRIGONOMETRY:

Expansions of sin(nθ) and cos(nθ) in a series of powers of sinθ and cosθ -

Expansions of sin n θ, cos n θ, tan n θ in a series of sines, cosines and tangents of multiples of "θ" -Expansions of sinθ, cosθ and tanθ in a series of powers of "θ" – Hyperbolic and inverse

hyperbolic functions .Chapter 6, Section 6.1 to 6.3.

UNIT 5 DIFFERENTIAL CALCULUS:

Successive differentiation, n th derivatives, Leibnitz theorem (without proof) and applications, Jacobians, Curvature and radius of curvature in Cartesian co-ordinates, maxima and minima of functions of two variables- Simple problems

Chapter 1, Section 1.1 to 1.3.1 and 1.4.3.

CONTENT AND TREATMENT AS IN

Allied Mathematics, Volume I and II, by P. Duraipandian and S. Udayabaskaran, S. Chand

Publications

REFERENCE:-

1. S.Narayanan and T.K. Manickavasagam Pillai – Ancillary Mathematics,

S. Viswanathan Printers, 1986, Chennai.

2. Allied Mathematics by Dr. A. Singaravelu, Meenakshi Agency.

E-RESOURCES:

1. http://www.themathpaage.com

2. http://nptel.ac.in

அடித்தளப்படிப்பு - பகுதி - I தமிழ்

SEMESTER I	Subject Title	Subject Code	Total Hours	Credit
	அடித்தளப்படிப்பு - பகுதி - I தமிழ்	**NLT1C**	**30**	**2**

பாடத்திட்டத்தின்நோக்கம் (Objective)

தமிழ்மொழியைப்பேசவும்எழுதவும்படிக்கவும்தெரியாதமாணவர்கள் அடிப்படைத்தமிழ்பாடம்படித்துப்பயன்பெறும்நோக்கில்பாடத்திட்டம் அமைகிறது.

அண்டைமாநிலங்களிலிருந்தும்பிறநாடுகளிலிருந்தும்இளங்கலை, இளம்அறிவியல்பட்டம்பெறும்மாணவர்கள்தமிழ்நாட்டின்மாநிலமொழியைப்

பேசவும்எழுதவும்துணைபுரியும்வகையில்பாடத்திட்டம் வடிவமைக்கப்பட்டுள்ளது.

இம்மாணவர்கள்முதற்பருவத்தில்தமிழ்மொழியின்எழுத்துக்களைஎழுதவும் படிக்கவும்பயிற்சிஅளிக்கப்படுகிறது. மேலும்தமிழ்மொழியின்சொல்வகை, தொடரமைப்பு, தமிழில்எண்ணுப்பெயர்கள், உடல்உறுப்புகள், அன்றாட வாழ்விற்குத்தேவையானபொருள்களைஅறிந்துகொள்ளவைப்பதேஇதன நோக்கமாகும்.

பாடத்திட்டம் - முதல்பருவம் (SYLLABUS)

அலகு - 1.

எழுத்துகள்

1. உயிர்எழுத்து, ஆய்தஎழுத்து, 2. மெய்எழுத்து , 3. உயிர்மெய்எழுத்து

அலகு - 2

சொற்கள்

1. பெயர்ச்சொல்,
2. வினைச்சொல்,
3. இடைச்சொல்,
4. உரிச்சொல்

அலகு -3.

தொடரமைப்பு

1. எழுவாய்,

2. பயனிலை,

3. செயப்படுப்பொருள்

அலகு -4.

பிழைநீக்கம்

1. ஒற்றுப்பிழை,

2. எழுத்துப்பிழை,

3. தொடர்ப்பிழை**,**

அலகு– 5

எண்கள், உறவுப்பெயர்கள், வாழ்இடங்களும், பொருள்களும்

அலகு - 6

அறிமுகம்

1. விழாக்கள்,

2. இயற்கை,

3. உணவுமுறைகள்-**சுவை-காய்கள்**-

பழங்கள்போன்றன.

பாடத்திட்டத்தின்பயன்கள் (Subject Outcome)

இந்தப்பாடத்தினால்வேற்றுப்புலமாணவர்கள்தமிழகத்தில்பாமர மக்களிடமும்தமிழில்பேசமுடியும்.
தமிழ்மொழியிலுள்ளசிறுசிறுபடைப்புகளைப் பார்த்துஇலக்கியஇன்பம்பெறமுடியும்.
தமிழகத்திலுள்ளசுற்றுலாத்தலங்களுக்கு வழிகாட்டிஇன்றிப்போய்வருதல்.

பாடநூல்தமிழ் – பகுதி 4 - சென்னைப்பல்கலைக்கழகம்அடிப்படைத்தமிழுக்குப்பாடத்திட்டங்கள்மட்டுமேவரையறுத்துள்ளது. அதைநூலாகவெளியிடவில்லை.எனவே, பாடநூல்இல்லை.

Reference book

தமிழ் – பகுதி 4 - சென்னைப்பல்கலைக்கழகம்வடிவமைத்த பாடத்திட்டங்கள்ஆகையால்குறிப்புதவிநூல்என்றுதனியாகஇல்லை.

(Reference book not applicable)

சிறப்புத்தமிழ் - முதல்பருவம்

SEMESTER I	Subject Title	Subject Code	Total Hours	Credit
	சிறப்புத்தமிழ் - முதல்பருவம்	**TLT1C**	**30**	**2**

பாடத்திட்டத்தின்நோக்கம் (Objective)

இப்பாடத்திட்டம்பள்ளிகளில்ஒருசிலவகுப்புகளில்தமிழைப்படித்துதமிழ் மொழியைமுழுமையாகஅறிந்துகொள்ளாதகல்லூரிகளில்பிறமொழி கற்பவர்களுக்காகவடிவமைக்கப்படுகிறது. இங்குதமிழ்இலக்கியப்பகுதியும், தமிழிலக்கியவரலாற்றுப்பகுதியும், மொழிப்பயிற்சியும்பாடமாகஅமைகிறது. தமிழ்இலக்கியஇன்பத்தைஉணரும்நோக்கிலும்இலக்கியவளத்தைஉணரும் நோக்கிலும்பாடத்திட்டம்உள்ளது.

பாடத்திட்டம் (SYLLABUS)

பாடப்பகுப்பு

I. இலக்கியம்

II. அதைச்சார்ந்ததமிழிலக்கியவரலாறு

III. மொழிப்பயிற்சி

அலகு -1

நாட்டுப்புறப்பாடல்

1. பஞ்சம்.

2. மானம்விடிவதெப்போ?

அலகு -2

புனைகதை

1.”கட்டைவிரல்” -சி.என்.அண்ணாதுரை

அலகு -3

புதுக்கவிதை

1. ஆடிக்காற்றே -சிற்பி,

2. கடமையைச்செய்-மீரா,

3. இழந்தவர்கள்-அப்துல்

ரகுமான்

அலகு - 4.

மொழித்திறன்

1. கலைச்சொல்லாக்கம்,

2. பொருந்தியசொல்தருதல்,

3. பிழைநீக்கி

எழுதுதல்

பாடத்திட்டத்தின்பயன்கள் (Subject Outcome)

இப்பாடத்தைப்படிப்பதால்தமிழ்மொழியின்இலக்கியஇன்பம், சொல்

வளம், புதுகலைச்சொல்படைத்தல்போன்றவற்றைஉணரஉதவுகிறது.

பாடநூல்

தமிழ் – பகுதி 4 - சென்னைப்பல்கலைக்கழகம்அடிப்படைத்தமிழுக்குப்

பாடத்திட்டங்கள்மட்டுமேவரையறுத்துள்ளது.
அதைநூலாகவெளியிடவில்லை.

எனவே, பாடநூல்இல்லை.

Reference book

தமிழ் – பகுதி 4 - சென்னைப்பல்கலைக்கழகம்வடிவமைத்த

பாடத்திட்டங்கள்ஆகையால்குறிப்புதவிநூல்என்றுதனியாகஇல்லை.

(Reference book not applicable)

SECOND SEMESTER

பொதுத்தமிழ் - முதலாமாண்டு - இரண்டாம்பருவம் (second semester)

SEMESTER II	Subject Title	Subject Code	Total Hours	Credit
	பொதுத்தமிழ் - முதலாமாண்டு - இரண்டாம்பருவம்	**LA12A**	**60**	**3**

பாடத்திட்டத்தின்நோக்கம்

காலந்தோறும்தமிழ்அடைந்துள்ளவளர்ச்சியும்பரந்துவிரிந்துகிடக்கும்அதன் ஆழஅகலத்தையும்ஒருபருந்துபார்வையில்நோக்கும்வகையில்பொதுத்தமிழ்ப் பாடப்பகுதிகட்டமைக்கப்பட்டுள்ளது.

பழந்தமிழ்இலக்கியங்களின்வாயிலாகஅறம், பொருள், இன்பம்ஆகியவற்றைப் போதித்தல். பழந்தமிழ்இலக்கியங்களின்இலக்கியச்செறிவையும், சொல்வளங்களையும்

உணரவைத்தல்.

பழந்தமிழ்ச்சொற்களின்அருமையைப்புரியவைத்துமொழிகலப்பின்றிப் பேசுவதன்அவசியத்தைவலியுறுத்தல். பழந்தமிழ்மக்களின்வாழ்வியலை எடுத்துரைத்தல். இவையேஇப்பாடத்திட்டத்தின்நோக்கமாகும்.

பாடத்திட்டத்தின்பயன்கள்

பழந்தமிழ்இலக்கியங்களின்வழியாக, அக்காலமக்களின்அகவுணர்வுகளையும் அகஒழுக்கங்களையும்பண்பாட்டையும்உணர்ந்துகொள்ளுதல். பழந்தமிழ்இலக்கிய

வாசிப்பின்வழிஇயற்கையின்உன்னதமகத்துவத்தைப்புரியவைத்தல்.

தமிழ்இலக்கியவளங்களின்வாயிலாகத்தமிழ்ப்பண்பாட்டைஅடுத்த தலைமுறைக்குக்கொண்டுசெல்லுதல். மொழிவளத்தின்தேவையைவலியுறுத்துதல்.

மாணவர்கள்பிழையின்றிஎழுதமொழிப்பயிற்சிஉதவுகிறது.

இப்பாடத்திட்டம்மாணவர்கள்தங்கள்நடிப்புதிறனைவளர்க்கின்றது.

போட்டித்தேர்வுகளைஎதிர்கொள்வதற்குத்தமிழ்இலக்கியவரலாற்றுப்பகுதிமிகுந்த

பயனுடையதாகஅமைகிறது.

I.இலக்கியம்

II.அதைச்சார்ந்ததமிழிலக்கியவரலாறு

III.மொழிப்பயிற்சி

அலகு 1

1. நற்றிணை - 87, 88

2. குறுந்தொகை - 46, 88, 89

3. கலித்தொகை - 11 ஆம்பாடல் - "அரிதாயஅறன்எய்தி..

அலகு 2

1. அகநானூறு - 86 ஆம்பாடல் (உழுந்துதலைபெய்த)

2. ஐங்குறுநூறு - கிள்ளைப்பத்து

3. பரிபாடல் -செவ்வேள் 5, கடுவன்இளவெயினார் (1 முதல் 10 வரிகள் - வெற்றி வேல்)

அலகு 3

1. புறநானூறு - 182, 192

2. பதிற்றுப்பத்து -காக்கைப்பாடினியார், நச்செள்ளையார்பாடல் (56, 57)

அலகு 4

1. பத்துப்பாட்டு - முல்லைப்பாட்டு

அலகு 5

1. திருக்குறள் - பொருட்பால் - 3 அதிகாரம் (காலமறிதல், சுற்றந்தழால், கண்ணோட்டம்)

2. நாலடியார் - ஈகை (முதல் 5 பாடல்கள்)

II தமிழிலக்கியவரலாறு

1. முச்சங்கவரலாறு, பதினெண்மேற்கணக்குநூல்கள் (எட்டுத்தொகை, பத்துப்பாட்டு)

2. பதினெண்கீழ்க்கணக்குநூல்கள்

III மொழிப்பயிற்சி

1. இலக்கணக்குறிப்பு (வேற்றுமைத்தொகை, உவமைத்தொகை, பண்புத்தொகை,

உம்மைத்தொகை, அன்மொழித்தொகை…..வடிவம்) [பத்தியிலிருந்துஇலக்கணக்

குறிப்புகளைக்கண்டறிதல்]

2. ஒற்றுமிகும்மிகாஇடங்கள்

3. மரபுத்தொடர்கள் (தமிழ்மரபுத்தொடர்களைக்கண்டறிதல்)

தமிழ் – பகுதி 1 -
சென்னைப்பல்கலைக்கழகம்வடிவமைத்தபாடத்திட்டங்கள்ஆகையால்குறிப்புத
விநூல்என்றுதனியாகஇல்லை. (Reference book not applicable)

FRENCH

WITH EFFECT FROM 2020-2021

SEMESTER II	Subject Title	Subject Code	Total Hours	Credit
	Foundation Course: Paper Il-Prescribed text and grammar-Il	**CLK2T**	**60**	**3**

LEARNING OBJECTIVES

In teaching French we aim to

- Provide the learners with a basic knowledge of grammar and gradually give them an insight into the culture and literature of France.
- Enable them to comprehend the nuances of the language so they are better equipped to express themselves in French.
- Discover another world, another people, another way of life.
- Make them more accepting of people who differ from them.

LEARNING OUTCOME:

Learners are able

- to comprehend and express themselves well
- to have an interest to look into another world
- to improve communication skills
- to perform well in the University Exams .

PRESCRIBED TEXTBOOK:

> RégineMérieux& Yves Loiseau, Latitudes 1, Paris, Didier, 2017 (Units 7-12 only).

UNITÉ 7 - C'ESTOÙ ?

Demander et indiquerune direction - localiser (près de, en face de …)

UNITÉ 8 - N'OUBLIEZPAS !

Exprimerl'obligationoul'interdit - Conseiller

UNITÉ 9 - BELLE VUE SUR LA MER !

Décrire un lieu - situer - se situer dans le temps

UNITÉ 10 - QUEL BEAU VOYAGE !

Raconter - décrire les étapes d’une action - exprimerl’intensité et la quantité - interroger

UNITÉ 11 - OH! JOLI!

Décrirequelqu’un - comparer - exprimerl’accordou le désaccord - se situer dans le temps

UNITÉ 12 - ET APRÈS ?

Parler de l’avenir - exprimer des souhaits - décrirequelqu’un

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FOUNDATION COURSE IN HINDI

SEMESTER II	Subject Title	Subject Code	Total Hours	Credit
	FOUNDATION COURSE IN HINDI	**CLE2G**	**60**	**3**

I. COURSE OBJECTIVES:

The objectives of the course are

1. To appreciate and analyse the dramatic elements in Hindi literature.
2. To understand the distinct features Hindi short stories and One Act Play.
3. To understand the importance and process of translation and the qualities of translators.
4. To understand the importance of vocabularies.

II. COURSE OUTCOMES:

1. Understand the role of Hindi short stories and One Act Play in the development of the society.
2. Knowledge about the importance of cultural, social and moral responsibility of human beings.
3. Enculcating the habit of book reading to gain knowledge of vocabularies.

UNIT – I

1. Auranzeb ki Aakhiri Raat

2. Mukthidhan

3. Practice of Annotation Writing

4. Practice of Summary and Literary evaluation Writing

UNIT – II

1. Laksmi ka Swagat

2. Mithayeewala

3. Practice of Annotation Writing

4. Practiceof Summary and Literary evaluation Writing

UNIT-III

1. Basant Ritu ka Natak

2. Seb Aur Dev

3. Practice of Annotation Writing

4. Practice of Summary and Literary evaluation Writing

UNIT-IV

1. Bahut Bada Sawal

2. Vivah ki Teen Kathayen

3. Practice of Annotation Writing

4. Practice of Summary and Literary evaluation Writing

UNIT-V

1. Translation Practice. (English to Hindi)

BOOKS FOR REFERENCE:

1. PrayojanMoolakHindi: Dr. Syed RahamathullaPoornimaPrakashan, 4/7, Begum III Street, Royapettah, Chennai – 14.
2. Anuvad Abhyas Part III Dakshin Bharat Hindi Prachar Sabha

COMMUNICATIVE ENGLISH-II

SEMESTER II	Subject Title	Subject Code	Total Hours	Credit
	COMMUNICATIVE-ENGLISH-II	**LZ12A**	**60**	**3**

COURSE OBJECTIVES:

- To develop communicative skills.
- To understand the relevance of Listening, Speaking, Reading and Writing in Communication.
- To develop understanding of grammar.
- To enhance vocabulary.

COURSE OUTCOMES:

At the end of this course students will be able to:

- Possess excellent Listening, Speaking, Reading and Writing skills in communicating in English.
- Have a good understanding of grammar and vocabulary.
- Make presentations and speeches.
- Familiarise themselves with script writing, drafting assignments, reading visual texts, drafting emails etc.

SYLLABUS:

UNIT I

1. Listening and Speaking

a. Listening and responding to complaints (formal situation)

b. Listening to problems and offering solutions (informal)

2. Reading and writing

a. Reading aloud (brief motivational anecdotes)

b. Writing a paragraph on a proverbial

expression/motivational idea.

3. Word Power/Vocabulary

a. Synonyms & Antonyms

4. Grammar in Context

Adverbs Prepositions

UNIT II

1. Listening and Speaking

a. Listening to famous speeches and poems

b. Making short speeches- Formal: welcome speech and vote of thanks.

Informal occasions- Farewell party, graduation speech

2. Reading and Writing

a. Writing opinion pieces (could be on travel, food, film / book reviews or

on any contemporary topic)

b. Reading poetry

b.i. Reading aloud: (Intonation and Voice

Modulation)

b.ii. Identifying and using figures of speech - simile, metaphor,

personification etc.

3. Word Power

. Idioms & Phrases

Grammar in Context Conjunctions and Interjections

UNIT III

1. Listening and Speaking

a. Listening to Ted talks

Making short presentations – Formal presentation with PPT, analytical

presentation of graphs and reports of multiple kinds

c. Interactions during and after the presentations , Reading and writing

a. Writing emails of complaint

b. Reading aloud famous speeches

3. Word Power

a. One Word Substitution

Grammar in Context: Sentence Patterns

UNIT V

1. Listening and Speaking

a. Informal interview for feature writing

b. Listening and responding to questions at a formal interview

2. Reading and Writing

a. Writing letters of application

b. Readers' Theatre (Script Reading)

c. Dramatizing everyday situations/social issues through

skits. (writing scripts and performing)

3. Word Power

a. Collocation

Grammar in Context: Working with Clauses.

PROFESSIONAL ENGLISH- II

SEMESTER II	Subject Title	Subject Code	Total Hours	Credit
	PROFESSIONAL ENGLISH- II	**PZ1SC -**	**30**	**2**

LEARNING OBJECTIVES:

1. The Professional Communication Skills Course is intended to help Learners in Arts and Science colleges,
2. Develop their competence in the use of English with particular reference to the workplace situation.
3. Enhance the creativity of the students, which will enable them to think of innovative ways to solve issues in the workplace.
4. Develop their competence and competitiveness and thereby improve their employability skills.
5. Help students with research bent of mind develop their skills in writing reports and research proposals.

LEARNING OUTCOMES:

1. At the end of the course, learners will be able to,
2. Attend interviews with boldness and confidence.
3. Adapt easily into the workplace context, having become communicatively competent.
4. Apply to the Research & Development organisations/ sections in ompanies and offices with winning proposals.

UNIT 1- COMMUNICATIVE COMPETENCE

Listening – Listening to two talks/lectures by specialists on selected subject specific topics - (TED Talks) and answering comprehension exercises (inferential questions)

Speaking: Small group discussions (the discussions could be based on the listening and reading passages- open ended questions

Reading: Two subject-based reading texts followed by comprehension activities/exercises

Writing: Summary writing based on the reading passages.

UNIT 2 - PERSUASIVE COMMUNICATION

Listening: listening to a product launch- sensitizing learners to the nuances of persuasive communication

Speaking: debates – Just-A Minute Activities

Reading: reading texts on advertisements (on products relevant to the subject areas) and answering inferential questions

Writing: dialogue writing- writing an argumentative /persuasive essay.

UNIT 3- DIGITAL COMPETENCE

Listening to interviews (subject related)

Speaking: Interviews with subject specialists (using video conferencing skills)

Creating Vlogs (How to become a vlogger and use vlogging to nurture interests – subject related)

Reading: Selected sample of Web Page (subject area) Writing: Creating Web Pages.

Reading Comprehension: Essay on Digital Competence for Academic and Professional Life.

The essay will address all aspects of digital competence in relation to MS Office and how they can be utilized in relation to work in the subject area

UNIT 4 - CREATIVITY AND IMAGINATION

Listening to short (2 to 5 minutes) academic videos (prepared by EMRC/ other MOOC videos on Indian academic sites – E.g. https://www.youtube.com/watch?v=tpvicScuDy0)

Speaking: Making oral presentations through short films – subject based Reading : Essay on Creativity and Imagination (subject based)

Writing – Basic Script Writing for short films (subject based)

Creating blogs, flyers and brochures (subject based)
Poster making – writing slogans/captions (subject based)

UNIT 5 - WORKPLACE COMMUNICATION & BASICS OF ACADEMIC WRITING

Speaking: Short academic presentation using PowerPoint.

Reading & Writing: Product Profiles, Circulars, Minutes of Meeting. Writing an introduction, paraphrasing

Punctuation (period, question mark, exclamation point, comma, semicolon, colon, dash, hyphen, parentheses, brackets, braces, apostrophe, quotation marks, and ellipsis)

Capitalization (use of upper case).

CORE-II: GENERAL CHEMISTRY – II **BCY-DSC02**

SEMESTER I	Subject Title	Subject Code	Total Hours	Credit
	PAPER - II GENERAL CHEMISTRY - II	SD22A	75	4

LEARNING OBJECTIVES:

- To equip learners with concepts in comparative study of S- Block elements
- To equip learners with concepts in comparative study of P- Block elements.
- To understand the aspects in gaseous state.
- To understand liquid state, colloids and nanomaterials.
- To enable them to understand chemistry of alkanes,cycloalkanes, alkenes and alkynes and conformational analysis.

LEARNING OUTCOMES:

- Learns were introduced to concept of s- block elements, learners (preparation and important properties and uses of Alkali and alkaline earth metals were learnt).
- Students learnt the p-block elements of Boron, Carbon family preparation, structure, extraction and uses.
- The concept of gaseous state - postulates, derivation and laws was understood.
- Students are able to understand the concept of liquid state, colloids and nano materials and its preparation, properties and uses.
- Understanding of the chemistry of alkanes, cycloalkanes, alkenes and alkynes and conformational analysis. Students are able to learn the mechanisms, preparation and properties in detail.

UNIT-I CHEMISTRY OF S- BLOCK ELEMENTS [GROUP IA AND IIA] (10 HRS)

Hydrogen: Position of hydrogen in the periodic table. Alkali metals: Comparative study of the elements with respect to oxides, hydroxides, halides, carbonates and bicarbonates. Diagonal relationship of Li with Mg. Extraction of Li from its silicate- ores. Preparation, properties and uses

of NaOH,Na_2CO_3, KBr $KClO_3$ alkaline earth metals: Comparative study of the elements with respect to oxides, hydroxides, sulphates, halides and carbonates. Extraction and anomalous behaviour of Be.

UNIT-II CHEMISTRY OF P- BLOCK ELEMENTS (10 HRS)

2.1 Boron Family [Group-IIIA]: preparation and structure of diborane and borazine. Chemistry of borax. Extraction of Al and its uses. Alloys of Al.

2.2 Carbon Family (Group -IV A): comparison of carbon with silicon. Carbon-di-sulphide – Preparation, properties, structure and uses. Percarbonates, per mono carbonates and per dicarbonates. Tin- Allotropic forms of Tin, alloys of tin, tinning, tin plating. Lead-lead accumulator (discharging and recharging), lead pigments.

UNIT-III GASEOUS STATE (15 hrs)

Postulates of kinetic theory of gases, derivation of gas laws from the kinetic gas equation. Kinetic energy and temperature-average translational kinetic energy and its calculation. Maxwell's distribution of molecular velocities (no derivation)-mean, root mean square and most probable velocity. Collision diameter, collision number, collision frequency, mean free path. Principle of equipartition of energy. Real gases- van der Waals equation of state-derivation. Boyle temperature. Significance of critical constants.

UNIT-IV 4.1 LIQUID STATE (20 hrs)

Some Properties of Liquids (molecular basis)-Equilibrium vapour pressure of a liquid, boiling point, heat of evaporation, heat of condensation, freezing point. Surface tension definition, measurement of surface tension, effect of temperature on surface tension. Parachor -definition, calculation and applications. Viscosity or fluidity-definition, measurement and calculation, factors affecting viscosity.

4.2 Nanoparticles of Au, Ag and TiO_2 –preparation, properties and uses. Carbon nanotubes-Types-preparation, properties and uses - Fullernene – Introduction only

UNIT-V (20 hrs)

5.1 Chemistry of Alkanes and Cycloalkanes: General methods of preparation and properties of alkanes and cycloalkanes, Conformational analysis of ethane and n-butane. Baeyer's strain theory.

5.2 Alkenes, Alkynes and Dienes: Preparation of alkenes (dehydrogenation, dehydrohalogenation and dehydration), preparation of alkynes (dehydrohalogenation, dehalogenation). Addition (with mechanisms) of H_2, X_2, HX, HOX, B_2H_6 and O_3 to alkenes and alkynes. Addition of HBr (peroxide effect; free radical reaction mechanism) to alkenes and alkynes.Allylic substitution of alkenes by NBS. Dienes types, stability; preparation of- 1,3-butadiene, isoprene, and chloroprene. Reactivity: 1,2- and 1,4- additions to butadiene. Diels-Alder reaction.

TEXTBOOKS:

1. Puri B.R., Sharma L.R. and Pathania M.S., Principles of Physical Chemistry, 47th ed., New Delhi, Vishal Publishing Co.,2016.

2. Puri B.R., Sharma L.R. and Kalia K.C., Principles of Inorganic Chemistry, 33th ed., New

Delhi, Milestone Publishers and Distributors, 2016.

3. Soni P.L., and Chawla H.M., Textbook of Organic Chemistry, 29th ed., New Delhi, Sultan Chand & Sons, 2007.

4. Understanding Chemistry, C N R Rao, Universities Press Private Limited, Chennai, 1999.

5. The Chemistry of the p-Block Elements: Syntheses, Reactions and Applications, Anil J Elias, Universities Press Private Limited, Chennai, 2019.

6. T. Pradeep, Nano: The Essentials, New Delhi, McGraw Hill, 2007.

REFERENCE BOOKS

1. Lee J.D. Concise Inorganic Chemistry, 5th ed., Blackwell Science, 2005.

2. Jain M.K, Sharma S.C. Modern Organic Chemistry, Vishal Publishing Co., 2017.

3. Soni, P.L. and Mohan Katyal. Textbook of Inorganic Chemistry, 20th ed., Sultan Chand & Sons, 2006.

4. Glasstone Samuel. Textbook of Physical Chemistry, 2nd ed., Macmillan India Ltd.,1990.

5. Soni. P.L., Dharmarha O.P. and Dash U.N Textbook of Physical Chemistry, 23rd ed., New Delhi, Sultan Chand & Sons,2011.

6. Graham Solomons T.W. Organic Chemistry, 3rd ed., John Wiley & Sons.

7. Morrison R T and Boyd R N, Organic Chemistry, 6th ed., Pearson Education, Asia,2002. 8. C.N. R. Rao, Chemistry of Nanomaterials: Synthesis, Properties and Applications, Wiley - VCH Verlag GmbH & Co. KgaA,2004.

9. Charles P. Poole Jr., Frank J. Owens, Introduction to Nanotechnology, New Jersey, John Wiley & Sons, 2003.

CORE-III: **MAJORPRACTICALS - I** **BCY-DSC03**

SEMESTER II	Subject Title	Subject Code	Total Hours	Credit
	CORE-III: **MAJORPRACTICALS - I**	**SD221**	90	3

LEARNING OBJECTIVES

- To understand about the origin and physical properties of Soil.
- To understand the chemical properties of soil and methods of analysing.
- To learn about the different types of plant nutrients and their importance.
- To learn about the fertilizers and their uses.
- To understand about the classification of various pesticides, fungicides and herbicides.
-

LEARNING OUTCOMES:

- To determine the unknown concentration of the known reactant, volumetric estimation was carried out and students understood well.Students learn to employ the volumetric calculations

The procedure for the practical examination will be given by the examiner]

The following volumetric analyses are prescribed.

1. Estimation of HCl by NaOH using a standard oxalic acidsolution
2. Estimation of $Na_2CO_3$by HCl using a standard Na_2CO_3solution
3. Estimation of oxalic acid by $KMnO_4$ using a standard oxalicacid.
4. Estimation of Ferrous sulphate by $KMnO_4$ using a standard Mohr's saltsolution.
5. Estimation of $KMnO_4$ by sodium thiosulphate using a standard $K_2Cr_2O_7$solution
6. Estimation of iron by $K_2Cr_2O_7$ solution using a standard Ferrous sulphate solution
7. Estimation of Copper sulphate using a standard$K_2Cr_2O_7$solution.
8. Estimation of Mg(II) by EDTA solution using standard Zinc sulphate solution.

9. Estimation of Zn(II) by EDTA solution using standard Magnesium sulphate solution.

10. Estimation of total hardness of water.

The following inorganic preparations are prescribed

1. Preparation of Ferrous ammonium sulphate or Mohr'ssalt

2. Preparation of potash alum or potassium aluminium sulphate

3. Preparation of microcosmic salt

4. Preparation of tetramminecopper (II) sulphate

Mathematics –II

(Effective from the Academic Year 2020-2021)

SEMESTER II	Subject Title	Subject Code	Total Hours	Credit
	Mathematics –II	**SM3AE**	**75**	**5**

COURSE OBJECTIVES:

1. Enable the students to know Integration using Recurrence relation and Fourier series for circular functions.
2. To understand Differential equations, Laplace transforms and its applications
3. To know the derivatives in Vector and Vector integration.

COURSE OUTCOMES:

1. Students will be able to apply reduction formulae to evaluate integrals and to find Fourier series of a given periodic function.
2. Student will be able to solve differential equations and to apply Laplace transform to solve differential and integral equations.
3. To find derivatives of vector functions and to evaluate Line, surface and Volume integrals using Greens, Stokes & Gauss divergence theorem and verifying the same.

UNIT 1: INTEGRAL CALCULUS:

Bernoulli formula – Reduction formulae-, (m,n being positive integers),Fourier series for functions in (0,2 , (-).

Chapter 2: Section 2.7 & amp; 2.9 , Chapter 4: Section 4.1.

UNIT 2: DIFFERENTIAL EQUATIONS:

Ordinary Differential Equations: second order non- homogeneous differential equations with constant coefficients of the form ay” +by’+ cy = X where X is of the form and -Related

problems only. Partial Differential Equations: Formation, complete integrals and general integrals, four standard types and solving Lagrange's linear equation P p +Q q= R.

Chapter 5: Section 5.2.1, Chapter 6: Section 6.1 to 6.4

UNIT 3: LAPLACE TRANSFORMS:

Laplace transformations of standard functions and simple properties, inverse Laplace transforms, Application to solution of linear differential equations up to second order- simple problems.

Chapter 7: Section 7.1.1 to 7.1.4 & 7.2 to 7.3

UNIT 4: VECTOR DIFFERENTIATION:

Introduction, Scalar point functions, Vector point functions,

Vector differential operator Gradient, Divergence, Curl, Solenoidal, irrotational, identities.

Chapter 8, Section 8.1 to 8.4.4

UNIT 5: VECTOR INTEGRATION:

Line, surface and volume integrals, Gauss, Stoke's and Green's theorems

(without proofs). Simple problems on these.

Chapter 8, Section 8.5 to 8.6.3.

CONTENT AND TREATMENT AS IN

Allied Mathematics, Volume I and II, P. Duraipandian and S. Udayabaskaran, S. Chand

Publications.

REFERENCE: -

1. S. Narayanan and T.K. Manickavasagam Pillai – Ancillary Mathematics, S. Viswanathan Printers, 1986, Chennai.

2. Allied Mathematics by Dr. A. Singaravelu, Meenakshi Agency.

E-RESOURCES:

1. http://www.sosmath.com

2.http://www.analyzemath.com/Differential_Equations/applicat

ions.html

அடிப்படைத்தமிழ் - இரண்டாம்பருவம்

SEMESTER II	Subject Title	Subject Code	Total Hours	Credit
	அடிப்படைத்தமிழ் - இரண்டாம்பருவம்	NLT2D	30	2

பாடத்திட்டத்தின்நோக்கம் (Objective)

தமிழ்மொழியைப்பேசவும்எழுதவும்படிக்கவும்தெரியாதமாணவர்கள் அடிப்படைத்தமிழ்பாடம்படித்துப்பயன்பெறும்நோக்கில்பாடத்திட்டம் அமைகிறது. அண்டைமாநிலங்களிலிருந்தும்பிறநாடுகளிலிருந்தும்இளங்கலை, இளம்அறிவியல்பட்டம்பெறும்மாணவர்கள்தமிழ்நாட்டின்மாநிலமொழியைப் பேசவும்எழுதவும்துணைபுரியும்வகையில்பாடத்திட்டம் வடிவமைக்கப்பட்டுள்ளது.

இம்மாணவர்கள்இரண்டாம்பருவத்தில்தமிழ்மொழியிலுள்ளசிறுசிறு இலக்கியப்பகுதிகளைப்படிப்பர். சிறுகதைகள், சுற்றுலாத்தலங்கள், தமிழ் இலக்கியங்களின்வரலாறுஆகியவற்றைப்புரிந்துகொள்ளும்நோக்கில் பாடத்திட்டம்அமைகிறது.

அலகு -1.

நீதிநூல்கள்

1. ஆத்திச்சூடி(1-12), 2. கொன்றைவேந்தன்(1-8),

3. திருக்குறள்(5)

1. அகரமுதல …… (1), 2. செயற்கரிய …….. (26), 3. மனத்துக்கண் …… (34), 4. கற்கசடறக்…….. (391), 5. எப்பொருள் ……. (423).

அலகு - 2.

நீதிக்கதைகள்

1. பீர்பால்கதை, 2. பரமார்த்தகுருகதை

அலகு - 3.

அறிமுகம்

அ. தமிழ்இலக்கியவரலாறு - இலக்கியங்கள்புலவர்கள்

ஆ.தமிழகவரலாறு - வரலாற்றுச்சின்னங்கள்- சுற்றுலாத்தலங்கள்- அலுவலகப் பெயர்கள்

இ.பழமொழிகள்.

பாடத்திட்டத்தின்பயன்கள் (Subject Outcome)

தமிழ்இலக்கியத்தின்சிறப்பினையும்தமிழ்மொழியின்சிறப்பினையும் மொழிவளத்தையும்அறிந்துகொள்ளஉதவுகிறது. தமிழகமக்களின் பண்பாட்டுக்கூறுகளைஉணர்ந்துகொள்ளுதல்

பாடநூல்

தமிழ் – பகுதி 4 - சென்னைப்பல்கலைக்கழகம்அடிப்படைத்தமிழுக்குப் பாடத்திட்டங்கள்மட்டுமேவரையறுத்துள்ளது. தைநூலாகவெளியிடவில்லை. எனவே, பாடநூல்இல்லை.Reference book.

சிறப்புத்தமிழ் - இரண்டாம்பருவம்

SEMESTER	Subject Title	Subject Code	Total Hours	Credit
II	சிறப்புத்தமிழ் - இரண்டாம்பருவம்	TLT2D	30	2

பாடத்திட்டத்தின்நோக்கம் (Objective)

இப்பாடத்திட்டம்பள்ளிகளில்சிலவகுப்புகள்வரையில்மட்டுமேதமிழைப் படித்துக்கல்லூரிகளில்பிறமொழிகற்பவர்களுக்காகவடிவமைக்கப்படுகிறது. இங்குதொடக்ககாலசெய்யுள்முதல்தற்காலபுதுக்கவிதைவரைஉள்ளஒருசில பகுதிகள்அமைந்துள்ளன. அனைத்துக்காலஇலக்கியங்களின்தன்மையை உணர்ந்துகொள்ளுதல். தமிழ்இலக்கியப்பகுதியும், தமிழிலக்கிய வரலாற்றுப்பகுதியும், மொழிப்பயிற்சியும்பாடமாகஅமைகிறது.

பாடப்பகுப்பு

I. இலக்கியம்

II. அதைச்சார்ந்ததமிழிலக்கியவரலாறு

III. மொழிப்பயிற்சி

அலகு - 1

கட்டுரை

1. பெண்ணின்பெருமை-திரு.வி.க

அலகு -2.

செய்யுள்

1. புறநானூறு - அ. கெடுகசிந்தை-ஓக்கூர்மாசாத்தியார்,

ஆ. ஈன்றுபுறந்தருதல் - பொன்முடியார், இ. யாதும்ஊரே -

கனியன்பூங்குன்றனார்

ஈ. திருக்குறள் - வான்சிறப்புமுழுமையும்

உ. சிலப்பதிகாரம் - மங்கலவாழ்த்துப்பாடல்

ஊ. திருவாசகம் - வேண்டத்தக்கது

எ. திருவாய்மொழி - உயர்வற

ஏ. இரட்சண்யயாத்ரிகம் (சிலுவைப்பாடு)-பாடல்எண்-1,3.4

ஐ. சீறாப்புராணம் - வானவர்க்கும்

ஒ. பாரதியார்- நல்லதோர்வீணை

அலகு -3.

இலக்கியவரலாறு

பாடம்தழுவியஇலக்கியவரலாறு

அலகு -4.

மொழிபெயர்ப்பு

ஆங்கிலப்பகுதியைத்தமிழாக்கம்செய்தல்

பாடத்திட்டத்தின்பயன்கள் (Subject Outcome)

தமிழ்மொழி, தமிழ்இலக்கியத்தின்தொன்மையையறிதல். தமிழ்மக்களின்

பண்பாட்டைக்காலவாரியாகஉணர்ந்துகொள்ளுதல்.

மொழிபெயர்ப்புத்துறையிலும்செயலாற்றமுடியும்

பாடநூல்

தமிழ் – பகுதி 4 - சென்னைப்பல்கலைக்கழகம்அடிப்படைத்தமிழுக்குப்

பாடத்திட்டங்கள் மட்டுமே வரையறுத்துள்ளது.
அதைநூலாகவெளியிடவில்லை.எனவே, பாடநூல்இல்லை.Reference book

THIRD SEMESTER

பொதுத்தமிழ் - இரண்டாமாண்டு – மூன்றாம்பருவம்

PART – I – SECOND YEAR – III SEMESTER

நோக்கும் கற்றல் பயன்பாடும் (2020 -2021)

SEMESTER III	Subject Title	Subject Code	Total Hours	Credit
	பொதுத்தமிழ்	LA13A	90	3

பாடத்திட்டத்தின் நோக்கம்

சைவம், வைணவம் சார்ந்த இலக்கியங்கள் பாடங்களாக வடிவமைக்கப்பட்டுள்ளன. பழந்தமிழ் மன்னர்களின் நீதியை விளக்கும் வகையில் உரைநடை அமைக்கப்பட்டுள்ளது. இந்த இலக்கியங்கள் சார்ந்த வரலாறும் பாடமாக அமைந்துள்ளன. மொழிப்பயிற்சியும் இடம்பெற்றுள்ளது.

· அறிவியலுக்கும் ஆன்மிகத்துக்கும் அன்றாட வாழ்வியலுக்கும் உள்ள தொடர்பினைப் புரிய வைத்தலே இப்பாடத்திட்டத்தின் நோக்கமாகும்.

· இறைப்பணியோடு மக்கள் பணி செய்த இறை அன்பர்களை அடையாளம் காட்டுவதும் இதன் தலையாய நோக்கமாகும்.

பாடத்திட்டம்

பாடப்பகுப்பு

I. இலக்கியம்

II. அதைச் சார்ந்த தமிழிலக்கிய வரலாறு

III. மொழிப் பயிற்சி

அலகு - 1

அ, தேவாரம் - திருநாவுக்கரசர் (நமச்சிவாயப் பதிகம்)

ஆ, திருவாசகம் - மாணிக்கவாசகர்

(திருவெம்பாவை முதல் 10 செய்யுள்கள்)

இ, நாலாயிரத்திவ்யப்பிரபந்தம் - ஆண்டாள்

(நாச்சியார் திருமொழி - வாரணம் ஆயிரம் தொடங்கி..10 செய்யுள்கள்)

அலகு - 2

கம்பராமாயணம் – கம்பர் - கும்பகருணன் வதைப்படலம்

அலகு - 3

பெரியபுராணம் - சேக்கிழார் - காரைக்கால் அம்மையார் புராணம்

அலகு - 4

உரைநடை - மனுமுறைகண்ட வாசகம் - இராமலிங்க அடிகளார்

அலகு - 5

தமிழிலக்கிய வரலாறு

அ. பல்லவர் கால பக்தி இலக்கியங்கள்

ஆ. பிற்காலச் சோழர்காலப் பேரிலக்கியங்கள்

இ. காப்பிய இலக்கிய வரலாறு

அலகு - 6

மொழிப்பயிற்சி

1.தனியார் நிறுவனத்துக்கு வேலைவாய்ப்பு வேண்டி விண்ணப்பம் எழுதுதல்,

2. ஊராட்சி, பேரூராட்சி, நகராட்சி, மாநகராட்சிக்கு,

அ) தெருக்குழாய் குடிநீர் இணைப்பு வேண்டி

ஆ) வீட்டுக்குக் குடிநீர் இணைப்பு வேண்டி

இ) தெருக்குப்பைகளை அப்புறப்படுத்த வேண்டி

ஈ) கொசுத்தொல்லையை நீக்க மருந்து தெளிக்க வேண்டி

உ) வெறிநாய்களைக் கட்டுப்படுத்த வேண்டி

ஊ) தெருச்சாலைகளைச் செப்பனிட வேண்டி

எ) இரயில் பாதையின் மேல் மேம்பாலம் கட்டவேண்டி

விண்ணப்பம் எழுதுதல்.

பாடத்திட்டத்தின் பயன்கள்

- இறைபக்தியின் இன்றியமையாமை உணர்த்துதல்.
- சமயச் சான்றோர்கள் தமிழ் மொழிக்கு ஆற்றியுள்ள பங்களிப்புகளை அறிந்து கொள்ளுதல்.
- நாயன்மார்களும் ஆழ்வார்களும் தங்கள் புலமையினால் பாசுரங்களைப் படைத்ததோடு நில்லாமல் இசையோடு இசைத்துள்ளமையால் இசையின் தொன்மையினை அறிதல்.
- பக்தி இலக்கிய ஓதலின் வழி இறைச்சிந்தனையை

  மேம்படுத்துதல்.

- தமிழ் இலக்கிய வரலாற்றுப்பகுதி போட்டித்தேர்வுக்கு உறுதுணையாக விளங்குதல் ஆகியவையே பயன் ஆகும்.

பாடநூல்:

· சென்னைப்பல்கலைக்கழகம் (University of Madras)

அடித்தளப் படிப்பு - பகுதி - I பொதுத்தமிழ் மூன்றாம் மற்றும் நான்காம் பருவங்களுக்குரியது. அனைத்துப் பட்டப்படிப்பு பிரிவுகளுக்கும் ஐந்தாண்டு ஒருங்குமுறை பட்ட மேற்படிப்புப் பிரிவுகளுக்கும் பொதுவானது. தாள் -I - செய்யுள் திரட்டு Foundation Course - Part - Tamil - For I & II Semesters

Common to all undergraduate course and Five Year Integrated

postgraduate courses. 2016 - 2017 onwards.

· தமிழ் இலக்கிய வரலாறு – பாடம் தழுவிய இலக்கிய வரலாறு

· மொழிப்பயிற்சிReference book

தமிழ் – பகுதி 1 - சென்னைப் பல்கலைக்கழகம் வடிவமைத்த

பாடத்திட்டங்கள் ஆகையால் குறிப்புதவிநூல் என்று தனியாக இல்லை.

FOUNDATION COURSE: PAPER LLL-FRENCH III

SEMESTER III	Subject Title	Subject Code	Total Hours	Credit
	Translation, Comprehension and Grammar- I	CLK3V	90	3

LEARNING OBJECTIVES

1. Provide the learners with a basic knowledge of grammar and gradually give them an insight into the culture and literature of France
2. -enable them to comprehend the nuances of the language so they are better equipped to express themselves in French
3. -discover another world, another people, another way of life.
4. -make them more accepting of people who differ from them.

LEARNING OUTCOME:

Learners are able

1. - to comprehend and express themselves well
2. - to have an interest to look into another world
3. - to improve communication skills
4. - to perform well in the University Exams

SYLLABUS:

GRAMMAR COMPONENTS:

- Les pronomsrelatifs
- Le passé composé
- L'imparfait
- Le plus-que-parfait
- Le subjonctif
- Le conditionnel
- La comparaison

TEXTS:

- Les feuillesmortes
- Le vraipère
- Nos études
- Demain des l'aube

- Par unejournéed’été
- Une visiteinattendue
- L’hiver
- Le librairie

Prescribed textbook:K.Madanagobalane&N.C.Mirakamal, Le français par les textes, Chennai, SamhitaPublications-Goyal Publisher & Distributors Pvt Ltd, 2017.

FOUNDATION COURSE IN HINDI

SEMESTER III	Subject Title	Subject Code	Total Hours	Credit
	Ancient Poetry and Introduction to Hindi	CLE3H	90	3

I. COURSE OBJECTIVES:

The objectives of the course is to

1. Describe the beginning stage of Hindi literature in the development of Hindi
2. language.
3. Describe the influence of Mughal dynasty on Indian culture and the poetic skill of
4. Indian poets.
5. Understand the importance of Bhakthikaal in bringing the unity in diversity.
6. Describe the History of Hindi literature
7. Describing the role played by poets of Aadhikaal, Bhakthi Kaal and Reethi Kaal for
8. the development of Hindi literature and the society**.**

II. COURSE OUTCOMES:

1. Understanding the role played by the poets of Bhakthi cult in literature and society.
2. Describing the Ram leela and Krishna leela poetry by Thulsidas, Surdas and
3. Meera bai respectively by relating it with philosophy of life.
4. Knowledge about the influence of Rama Bhakthi and Krishna Bhakthi in Indian Religion and literature.
5. Knowledge about Idol worship concepts and the influence of it in the development of Indian culture and Patriotic spirit.
6. Knowledge about the Aadhikaal of its artitect skill, Reethikall of its shringarras.
7. Knowledge about the Idolless worship and Prem Marga cult of literature.
8. Knowledge about the Histry of Hindi Litrature upto Reethi Kaal.

LESSONS PRESCRIBED:

1. Kabirdas - Saakhi (Dohas from 1 to 10)

2. Surdas - Bramargeet Saar only

3. Tulasidas – Vinay ke Pad only

4. Meera Bai – Pad only

5. Tiruvalluar (Dharmakaand only)

6. Biharilal (Dohas 1 to 5)

2. INTRODUCTION TO HINDI LITERATURE (UP TO REETHIKAAL) LESSONS PRESCRIBED :

1. Literary Trends of Veeragatha Kaal (Aadikaal) - Important poets :

2. Chand Baradai 2. Vidhyapathi and their Works

2. Literary Trends of Bhakthi Kaal – Important Poets : 1. Kabirdas 2. Joyasi

3. Tulasidas 4. Surdas and their works

3. Literary Trends of Reethikaal – Important Poets :

1. Bihari 2. Bhushan 3. Ghananan

UNIT –I

1. Kabirdas - Saakhi (Dohas from 1 to 10)

2. Literary Trends of Veeragatha Kaal (Aadikaal)

3. Chand Baradai and his Works

4. Vidhyapathi and his works

UNIT - II

1. Surdas - Bramargeet Saar

2. Literary Trends of Bhakthi Kaal

3. Gyan Margi Shakha

4. Important Poet : 1. Kabirdas

UNIT - III

1. Tulasidas – Vinay ke Pad only

2. Literary Trends of Bhakthi Kaal – Prem Margi Shakha

3. Literary Trends of Bhakthi Kaal - Ram Bhakthi Shakha

4. Important Poets – 1. Joyasi and 2. Tulasidas

UNIT - IV

1. Meera Bai – Pad only

2. Tiruvalluar (Dharmakaand only)

3. Literary Trends of Bhakthi Kaal – Krishna Bhakthi Shakha

4. Important Poet – Surdas

UNIT - V

1. Biharilal (Dohas 1 to 5)

2. Literary Trends of Reethikaal

3. Important Poet: Bihari and his works

4. Bhushan and his works and Ghananand and his works

1. Ancient Poetry

PRESCRIBED TEXT BOOK: Selections in Poetry (2007) Reference Books:

1. Hindi Sahithya Ka Itihas By: Ramchandra Shukla, Jayabharathi Publications, 217, B, Maya Press Road, Allahabad– 211 003.

2. Hindi Sahithya Yug Aur Pravrithiya By: Dr.SivakumarVarma, Asok Prakashan Nayi Sarak, New Delhi – 6

3. Hindi Sahithya ka SybodhItihas By: Babu Gulabroy, Lakshmi Narayanan Agarwas Book Publishers seller,Anupama Plaza-1, Block.No.50, Sanjay Place, Agra- 282002.

LANGUAGE THROUGH LITERATURE – I

SEMESTER III	Subject Title	Subject Code	Total Hours	Credit
	LANGUAGE THROUGH LITERATURE – I	**LZ13B**	60	3

LEARNING OBJECTIVES:

1. To use literature as a medium to teach/learn grammar, reading, spelling, vocabulary, writing mechanics, creative writing and thinking skills
2. To strengthen contextual understanding of the language through texts relevant to specific disciplines and offer scope for imaginative involvement and self-expression
3. To stimulate interest in acquiring twenty first century skills
4. To engage in self-assessment activities for self- development
5. To help absorb the values**,** ethics and attitudes of life and culture expressed in literature

LEARNING OUTCOMES:

After completing the course, the students will be able to

1. reveal the extent of enhancement of their vocabulary and use themappropriately to communicate in contexts.
2. Become aware of commonly occurring errors and avoid committing them inlanguage use.
3. Rewrite words and sentences by changing their forms and use themappropriately.
4. Show improvement in their pronunciation.
5. Attempt different kinds of writing – essays, emails, blogs, letters etc.
6. Prepare resumes to face interviews.
7. Convert short stories into plays or skit.
8. Role play the scenes and make a dramatic presentation of the scenes.
9. Create a webpage for themselves and others.
10. Show their awareness of contemporary issues and themes that are sociallyrelevant by reading texts of different literary genres.

SYLLABUS:

THEME	TEXT	ENGLISH LANGUAGE SKILLS
Ethics	1.1 Humanities vs Sciences *S. Radhakrishnan* **Worksheet 1.1**	Vocabulary skills • Etymology • Etymological derivation of words Grammar skills • Tenses • The simple present vs the presentcontinuous tense • The simple past vs present perfect tense

Learning	1.2 Wings of Fire (An Extract) *A. P. J. Abdul Kalam* **Worksheet 1.2**	Vocabulary skills □ One-word substitutes / meanings of expressions Grammar skills □ Combining sentences
Society	1.3 On the Rule of the Road *A. G. Gardiner* **Worksheet 1.3**	Vocabulary skills • Some literary devices • Word association Grammar skills • Error identification • Types of questions: Wh- and Yes/No

UNIT 2: POETRY[12 Hours]		
THEME	**TEXT**	**ENGLISH LANGUAGE SKILLS**
Human Values	2.1 Leisure *W. H. Davies* **Worksheet 2.1**	Vocabulary skills • Content words and function words • Compound words Grammar skills • Punctuation • Use of punctuation marks • Conversion of sentences ▪ Active and passive voice ▪ Reported speech
Science	2.2 The Secret of the Machines *Rudyard Kipling* **Worksheet 2.2**	Vocabulary skills • Commonly confused words • Prefixes and suffixes • Negative prefixes

		Grammar skills • Conversion of word class
Environment	2.3 Water *Ralph Waldo Emerson* **Worksheet 2.3**	Vocabulary skills • Homophones • Homonyms • Homographs Grammar skills • Gerunds • Participles
Sports	2.4 Casey at the Bat *Earnest Lawrence Thayer* **Worksheet 2.4**	Vocabulary skills • Completing words Grammar skills • Phrasal verbs
Satire	2.5 Very Indian Poem in Indian English *Nissim Ezekiel* **Worksheet 2.5**	Vocabulary skills • Metonymy Grammar skills • Integrated grammar activities • Cloze test

UNIT 3: SHORT STORIES[15 Hours]		
THEME	**TEXT**	**ENGLISH LANGUAGE SKILLS**
Attitude	3.1 Witches' Loaves *O. Henry* **Worksheet 3.1**	Pronunciation • Tongue twisters • Pronouncing words of foreign origin • Using a dictionary to understand pronunciation
Fantasy	3.2 The Country of the Blind *H. G. Wells* **Worksheet 3.2**	Writing skills • Descriptive writing • Narrative writing • Writing long essays
Humour	3.3 The Boy Who Broke theBank *Ruskin Bond* **Worksheet 3.3**	Writing skills • Converting a story into a play
Social Justice	3.4 The Squirrel *Ambai* **Worksheet 3.4**	Writing skills • Filling forms • Letter writing

UNIT 4: NON-FICTION[14 Hours]		
THEME	**TEXT**	**ENGLISH LANGUAGE SKILLS**
Artificial Intelligence	4.1 AI and Literature: The Muse in the Machine *John Thornhill* **Worksheet 4.1**	Writing skills • Writing blogs • Creating vlogs
Social Media	4.2 Facebook Is Making Us Miserable *Daniel Gulati* **Worksheet 4.2**	Writing skills • Writing emails
Culture	4.3 One World One Culture *Kenneth J. Pakenham, Jo McEntire, Jessica Williams* **Worksheet 4.3**	Writing skills • Résumés • Cover letters • Format of a cover letter Speaking skills • Introduction to job interviews
Food and Nutrition	4.4 Portion Size is the Trick!!! *Ranjani Raman* **Worksheet 4.4**	Writing skills • Argumentativeessays

<table>
<tr><td colspan="3">UNIT 5: SCENES FROM SHAKESPEARE[14 Hours]</td></tr>
<tr><td>THEME</td><td>TEXT</td><td>ENGLISH LANGUAGE SKILLS</td></tr>
<tr><td rowspan="4">Human Nature</td><td>5.1
The Merchant of Venice [Act IV, Scene I; Lines 170–419]</td><td rowspan="3">Writing skills

• Recreating a court scene
• Role play</td></tr>
<tr><td>Worksheet 5.1</td></tr>
<tr><td></td></tr>
<tr><td>5.2
Henry IV Part I [Act II, Scene 4]</td><td rowspan="3">Writing skills

• Creating a webpage</td></tr>
<tr><td>Worksheet 5.2</td></tr>
<tr><td></td></tr>
<tr><td colspan="2">Formative Assessment
[5 Hours]</td><td>Unit- end Assessment Tasks I- V</td></tr>
</table>

CORE-IV: GENERAL CHEMISTRY – III **BCY-DSC04**

SEMESTER III	Subject Title	Subject Code	Total Hours	Credit
	CORE-IV: GENERAL CHEMISTRY – III	SD23A	75	4

LEARNING OBJECTIVES:

- Students will understand the general characteristics of Nitrogen and Oxygen families.
- Learning the chemistry of Halogens and noble gases.
- Learning the mechanism of Nucleophilic substitution and Elimination reactions.
- Learning the fundamentals of the reaction mechanisms of aromatic and heterocyclic compounds.
- Students will learn the basic concepts of Thermodynamics and Thermochemistry.

UNIT-I:

CHEMISTRY OF NITROGEN AND OXYGEN FAMILIES (15hrs)

1.1 Group VA elements: General characteristics of Group VA elements; chemistry of H2N-NH_2, NH_2OH, HN_3 and HNO_3. Chemistry of PH_3, PCl_3, PCl_5, $POCl_3$,P_2O_5 and oxyacids of phosphorous (H_3PO_3 and H_3PO_4).

1.2 Group VIA elements: General properties of group VIA elements - Structure and allotropy of elements-chemistry of ozone - Classification and properties of oxides - oxides of sulphur and selenium - Oxyacids of sulphur (Caro's and Marshall'sacids).

UNITII: CHEMITRY OF HALOGENS AND NOBLE GASES (15hrs)

2.1 Chemistry of Halogens: General characteristics of halogen with reference to electro-negativity, electron affinity, oxidation states and oxidizing power. Peculiarities of fluorine. Halogen acids (HF, HCl, HBr and HI), oxides and oxyacids ($HClO_4$). Inter-halogen compounds (ICl, ClF_3, BrF_5 and IF_7), pseudo halogens [$(CN)_2$ and $(SCN)_2$] and basic nature of Iodine.

2.2 Noble gases: Position in the periodic table. Preparation, properties and structure of XeF_2, XeF_4, XeF_6 and $XeOF_4$; uses of noble gases- clathrate compounds.

UNIT III: NUCLEOPHILIC SUBSTITUTION AND ELIMINATION REACTIONS (10hrs)

3.1 Nucleophilic substitution: SN1, SN2 and SNi reactions-mechanismsstereochemistry - effect of solvent, structure of substrate, nucleophilicity of the reagent [nucleophile] and nature of the leaving group.

3.2 Elimination reactions: E1, E2 and E1CB reactions and mechanisms: Hofmann and Saytzeff rules. Elimination vs Substitution.

UNIT IV: BENZENE AND POLYNUCLEARAROMATICHYDROCARBONS (15hrs)

Aromaticity - conditions for aromaticity - resonance stabilization energy - Hückel rule with respect to benzene, naphthalene, anthracene andphenanthrene; Electrophilic substitution in benzene-general mechanism; nitration, sulphonation, halogenations, Friedel-Crafts alkylation and acylation. Orientation [directive influence] and reactivity in mono substituted benzenes. Polynuclear hydrocarbons-naphthalene, anthracene and phenanthrene-preparation, properties and uses.

UNIT V: THERMODYNAMICS-I (20 hrs)

5.1 Terminology of thermodynamics-Thermodynamic equilibrium-nature of work and heat-First law of Thermodynamics-statement-definition of Internal Energy (E), Enthalpy (H) and Heat capacity. Relation between Cp and Cv. Calculation of W, q, dE and dH for expansion of ideal and real gases under isothermal and adiabatic condition of reversible and irreversible processes. Joule- Thompson effect and Coefficient (μJT)-Calculation of μJT for ideal and real gases - Inversion temperature.

5.2 Thermochemistry - Relation between enthalpy of reaction at constant volume (qv) and at constant pressure (qp) - Temperature dependence of heat of reaction - Kirchoff equation-Derivation and application-Enthalpy of formation and combustion - Bond energy and its calculation from thermochemicaldata.

TEXTBOOKS :

1. Puri B.R., Sharma L.R. and Pathania M.S., Principles of Physical Chemistry, 47th ed., New Delhi, Vishal Publishing Co.,2016.
2. Puri B.R., Sharma L.R. and Kalia K.C., Principles of Inorganic Chemistry, 33th ed., New Delhi, Milestone Publishers and Distributors,2016.
3. Soni P.L., and Chawla H.M., Textbook of Organic Chemistry, 29th ed., New Delhi, Sultan Chand & Sons, 2007.
4. Jain M K and Sharma S C, Modern Organic Chemistry, Vishal Publications,2018.

REFERENCE BOOKS

1. Lee J.D. Concise Inorganic Chemistry, 5th ed., Blackwell Science,2005.

2. Soni, P.L. and Mohan Katyal. Textbook of Inorganic Chemistry, 20th ed., Sultan Chand &Sons, 2006.

3.Glasstone Samuel. Textbook of Physical Chemistry, 2nd ed., Macmillan India Ltd.,1990.

4. Soni P.L., Dharmarha O.P. and Dash U.N Textbook of Physical Chemistry, 23rd ed., New Delhi, Sultan Chand & Sons,2011.

5. Graham Solomons T.W. Organic Chemistry, 3rd ed., John Wiley &Sons.

6. Morrison R.T. and Boyd R.N., Organic Chemistry, 6th ed., Pearson Education, Asia,2002.

ALLIED PHYSICS-I

(For B.Sc., Mathematics, Chemistry and Computer Science students)

SEMESTER III	Subject Title	Subject Code	Total Hours	Credit
	ALLIED PHYSICS-I	SR3AA	60	3

COURSE OBJECTIVE:

This paper introduces the students to the basic concepts of Elasticity, Rotational motion, Heat and thermodynamics, Sound, Optics, Atomic and Nuclear Physics

LEARNING OUTCOME:

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

1. Explore the fundamental concepts of physics.
2. Import knowledge about the importance of material properties, heat, sound, optics, atomic and nuclear physics.
3. Understand the energy involved in nuclear reaction.
4. Carry out the practical by applying these concepts.
5. Get depth knowledge of physics in day today life.

UNIT I: PROPERTIES OF MATTER

Young's modulus – Rigidity modulus – Bulk modulus – Poisson's ratio (definition alone) –Bending of beams – Expression for Bending Moment – Determination of Young's Modulus –Uniform and Non-Uniform bending.

Expression for Couple per unit twist – Work done in twisting a wire – Torsional oscillations of abody– Rigidity modulus of a wire and M.I. of a disc by Torsion Pendulum.

UNIT II: VISCOSITY

Viscosity – Viscous force – Co-efficient of Viscosity – Units and Dimensions – Poiseuille'sformula for co-efficient of viscosity of a liquid – determination of co-efficient of viscosity usingburette and comparison of Viscosities - Bernoulli's theorem – Statement and proof – Venturimeter – Pitot tube.

UNIT III: CONDUCTION, CONVECTION AND RADIATION

Specific heat Capacity of Solids and Liquids – Dulong and Petit's law – Newton's law ofCooling – Specific Heat Capacity of a Liquid by Cooling – Thermal Conduction –Coefficient ofThermal Conductivity by Lee's disc Method.

Convention Process – Lapse Rate – Green House Effect – Black Body Radiation – Planck'sRadiation Law – Rayleigh Jean's Law, Wien's Displacement Law – Stefan's Law of Radiation.(No Derivations).

UNIT IV: THERMODYNAMICS

Zeroth and I Law of Thermodynamics – II law of Thermodynamics – Carnot's engine andCarnot's cycle – Efficiency of a Carnot's Engine – Entropy – Change in Entropy in Reversibleand Irreversible Process – Change in entropy of a perfect gas – Change in Entropy when Ice isconverted into steam.

UNIT V: OPTICS

Interference – Conditions for Interference Maxima and Minima – Air Wedge – Thickness of AThin Wire – Newton's Rings – Determination of Wavelength Using Newton's Rings.

Diffraction – Difference Between Diffraction and Interference – Theory of Transmission Grating– Normal Incidence – Optical Activity – Biot's Laws – Specific Rotatory Power – Determination

of Specific Rotatory Power Using Laurent's Half Shade Polarimeter.

BOOKS FOR STUDY:

1. Properties of matter, Brijlal and Subramanyam, Eurasia Publishing co., New Delhi, III Edition 1983

2. Element of properties of matter, D.S.Mathur, S.Chand& Company Ltd, New Delhi, 10th Edition 1976

3. Heat and Thermodynamics, Brijlal&Subramanyam, S.Chand& Co, 16th Edition 2005

4. Heat and Thermodynamics, D.S. Mathur, Sultan Chand& Sons, 5th Edition 2014.

5. Optics and Spectroscopy, R.Murugeshan, S.Chand and co., New Delhi, 6thEdition 2008.

6. A text book of Optics, Subramanyam and Brijlal, S. Chand and co., New Delhi, 22nd

Edition 2004.Optics, Sathya Prakash, Ratan PrakashanMandhir, New Delhi, VII Edition 1990.

ESSENTIALS OF SPOKEN & PRESENTATION SKILL - LEVEL I

SEMESTER	Subject Title	Subject Code	Total Hours	Credit
III	**ESSENTIALS OF SPOKEN & PRESENTATION SKILL - LEVEL I**	**TSSEC**	30	2

LEARNING OBJECTIVES:

Courses on Soft skills are intended to improve the communication skills enrich personality development, Computing skills, Quantitative aptitude and knowledge of Foreign language of the students. These courses are intended to enhance the employability of the students.

LEARNING OUTCOME:

The courses will help to bridge the gap between the skill requirements of the employer or industry and the competency of the students.

SYLLABUS:

UNIT- I: COMMUNICATION SKILLS FOR EFFECTIVE BUSINESS PRESENTATION:

1. Perfecting oral skills
2. Aural skills
3. Reading skills

UNIT- I I: NON VERBAL COMMUNICATION:

1. Cultural codes for effective Business Presentation
2. Business Etiquettes

UNIT- III: FORMAL AND INFORMAL CONVERSATION:

1. Introducing
2. Opening & Closing speeches
3. Inviting
4. Thanking
5. Apologizing
6. Expressing anger
7. Resolving conflict
8. Giving and taking information

UNIT- IV: ETIQUETTES FOR PUBLIC SPEAKING

1. Extempore
2. Lectures
3. Interviews
4. Group discussion
5. Telephone conversation

6. Business meetings

UNIT- V: ETIQUETTES FOR BUSINESS PRESENTATION:

1. Team Presentation
2. Individual presentation

FOURTH SEMESTER

பொதுத்தமிழ் - இரண்டாமாண்டு – நான்காம்பருவம்

PART – I – SECOND YEAR-

நோக்கும்கற்றல்பயன்பாடும் (2021 – 2022)

SEMESTER IV	Subject Title	Subject Code	Total Hours	Credit
	பொதுத்தமிழ்		90	3

பாடத்திட்டத்தின்அறிமுகம்

இரட்டைக்காப்பியங்கள், இதிகாசகாப்பியம், புராணம், கிறித்துவ

காப்பியம், இசுலாமியகாப்பியம், சிற்றிலக்கியங்கள்ஆகியவற்றிலிருந்து

தேர்ந்தெடுக்கப்பட்டபகுதிகள்பாடமாகஅமைந்துள்ளன. இந்தஇலக்கியங்கள்

சார்ந்தவரலாறும்மொழிப்பயிற்சியும்பாடங்களாகஇடம்பெற்றுள்ளன.

பாடத்திட்டத்தின்நோக்கம்

காப்பியங்கள்தோன்றியவரலாற்றுப்பின்னணியையும்

வாழ்க்கைக்கூறுகளையும்கற்பதால்கலைஇலக்கியங்களின்வேறுபாட்டை

உணரவைத்தல். கற்பனைவளமும்சிந்தனைத்திறமும்இலக்கியச்சுவையும்

உடையநீண்டபுனைவேகாப்பியங்கள். இத்தகையஇலக்கியங்களின்

செழுமையையும்புலவர்களின்திறமையும்சமயஅறக்கோட்பாடுகளையும்

எடுத்துரைப்பதேஇதன்நோக்கமாகும்.

காப்பியஇலக்கியங்கள்தமிழகத்துக்கும்தமிழ்மொழிக்கும்தமிழ்

பண்பாட்டிற்கும்ஏற்றவகையில்அமைந்துள்ளமையைவிளக்கிக்கூறுதல்.

சிற்றிலக்கியங்கள்பாடுபொருளுக்கேற்பபடைக்கப்பட்டுள்ளமையை

உணரவைத்தல். இவைசார்ந்தஇலக்கியவரலாற்றினைக்கூறுவதும்

இப்பாடத்திட்டத்தின்நோக்கம்ஆகும்.

மொழிப்பயிற்சியில்துறைசார்கலைச்சொற்களைஅறிமுகப்படுத்திப்பு
திய

கலைச்சொற்களைஉருவாக்கவைத்தல்.
ஒவ்வொருமாணவர்களும்தங்கள்

சிந்தனைகளைவெளிகொணரும்வகையில்சிறுகதை, புதுக்கவிதை

போன்றவற்றைப்படைக்கத்தூண்டுதல். இதுவேஇப்பாடத்திட்டத்தின்

நோக்கமாகும்.

பாடத்திட்டம்

பாடப்பகிர்வு –

I இலக்கியம்

II அதைச்சார்ந்ததமிழிலக்கியவரலாறு

III மொழித்திறன்

அலகு 1

1. சிலப்பதிகாரம் – ஊர்காண்காதை(முழுமையும்)

2. மணிமேகலை – பாத்திரமரபுகூறியகாதை (முழுமையும்)

அலகு 2

1. சீவகசிந்தாமணி – ஏமாங்கதநாட்டுவளம் 10 பாடல்கள்மட்டும்

2. சூளாமணி – 5 பாடல்கள் (நாட்டுச்சருக்கம், நகரச்சருக்கம், தூதுசருக்கம்,

கல்யாணச்சருக்கம், சுயம்வரச்சருக்கம்)

அலகு 3

1. கம்பராமாயணம் – குகப்படலம்

2. பெரியபுராணம் – மெய்ப்பொருள்நாயனார்புராணம்

அலகு 4

1. சீறாப்புராணம் - உடும்புபேசியபடலம் (முழுமையும்)

2. தேம்பாவணி – வளன்சனித்தபடலம் (முழுமையும்)

அலகு 5

1. மீனாட்சியம்மைபிள்ளைத்தமிழ் – சப்பாணிபருவம் – 5 பாடல்கள்

2. திருக்குற்றாலக்குறவஞ்சி - மலைவளம்

II இலக்கியவரலாறு

1. காப்பியஇலக்கியங்கள்

2. சிற்றிலக்கியங்கள்

3. இஸ்லாமியஇலக்கியவரலாறு

4. கிறித்துவஇலக்கியவரலாறு

III மொழித்திறனறிதல்

i. கலைச்சொற்கள்

ii. படைப்பு – சிறுகதை (அ) புதுக்கவிதை

பாடத்திட்டத்தின்பயன்கள்

தனிப்பாடல்களாகஇருந்தஇலக்கியவகைநீண்டநெடியசெய்யுள்களால்

மாறியமரபுவேறுபாட்டைஉணரவைத்தல்.
தமிழ்க்காப்பியங்கள்வாயிலாகப்

பழந்தமிழகத்தின்பழமையானபுனைவுகள்பற்றிஅறிதல்.
மேலும்அக்கால

மக்களின்வாழ்வு, சமயம், அரசியல், பண்பாடுபோன்றவைதெரிந்துகொள்ளுதல்.

பழந்தமிழகத்தின்இயற்கைச்சூழல், காலநிலைஆகியவற்றைப் புரிந்துகொள்ளுதல். புராணக்கதைகளைவிளக்கமாகத்தெரிந்துகொள்ள தூண்டுதல்.

படைப்புகளைச்சொந்தமாகஉருவாக்குவதால்ஒவ்வொருமாணவனின் சிந்தனையும்மனநிலையும்உணர்தல்.
மேலும்மாணவர்கள்போட்டித்தேர்வுகளில் இவ்விலக்கியம்சார்ந்தகேள்விகளுக்குவிடையளித்தல். ஆகியவை இப்பாடத்திட்டத்தின்பயன்கள்ஆகும்.

பாடநூல்:

· சென்னைப்பல்கலைக்கழகம் (University of Madras)

அடித்தளப்படிப்பு - பகுதி - I தமிழ்

மூன்றாம்மற்றும்நான்காம்பருவங்களுக்குரியது.

· தமிழ் – பகுதி 1 - சென்னைப்பல்கலைக்கழகம்வடிவமைத்த பாடத்திட்டங்கள்ஆகையால்குறிப்புதவிநூல்என்றுதனியாகஇல்லை

FRENCH IV

SEMESTER IV	Subject Title	Subject Code	Total Hours	Credit
	TRANSLATION, COMPREHENSION AND GRAMMAR-L	CLK4W	90	3

LEARNING OBJECTIVES

In teaching French we aim to

- Provide the learners with a basic knowledge of grammar and gradually give them an insight into the culture and literature of France

- Enable them to comprehend the nuances of the language so they are better equipped to express themselves in French.

- Discover another world, another people, another way of life.

- Make them more accepting of people who differ from them.

LEARNING OUTCOME:

Learners are able

- to comprehend and express themselves well

- to have an interest to look into another world

- to improve communication skills

- to perform well in the University Exams

GRAMMAR COMPONENTS:

- Le passé simple
- Temps du passé - Emplois (le passé composé,l'imparfait,le passé simple,le plus-que-parfait)
- L'expression de la cause
- L'expression de la conséquence

- L’expression du but
- L’expression de la concession
- L’expression de la condition et de l’hypothèse

PRESCRIBED TEXTBOOK:

K. Madanagobalane & N.C. Mirakamal, Le français par les textes, Chennai, Samhita Publications-Goyal Publisher & Distributors Pvt Ltd, 2017.

MODERN POETRY AND INTRODUCTION TO HINDI LITERATURE

SEMESTER IV	Subject Title	Subject Code	Total Hours	Credit
	Modern Poetry and Introduction to Hindi Literature	CLE4J	90	3

I. COURSE OBJECTIVES:

Objective of the course is to

1. Gain awareness about the social, cultural and literary situations during the Aadhu Nic Kaal.
2. Gain awareness on the importance of literature in addressing contemporary issues such as an environmental concern, gender issues, social problems, thereby giving effective solution to such problems.
3. Acquire a comprehensive knowledge of historical, literary and theoretical aspects of Hindi literature, and all the genres of literature leading to the understanding of literary movements from times immemorial.
4. Imparting knowledge if Hindi as a world language and make communicate both in speaking and writing in a variety of contexts and genres.
5. Imparting the knowledge about the beginning and the development of modern Hindi literature such drama, short stories, novels, journalism and the famous writers like Acharya Ramachandra Shukla, BharathendhuHarichandra, etc. Influence of British rule on Indian society.

II. COURSE OUTCOMES:

1. Analysing the development of Khadiboli Hindi

2. Knowledge about the reason of emergence of Aadhunik Kaal in Hindi Iiterature.

3. Knowledge about the literary trends of Aadhunik Kaal.

4. Identifying the history of development of Hindi drama, short stories and novels, i.e. prose and journalism.

5. Good knowledge of literature that includes the comprehension of recent developments in Hindi language and literature the world over.

6. Major impact on the development of society, helps shaping civilizations, bringing Transformations, changing political systems and exposing injustice by giving detailed preview of human experiences.

7. Understand the impact of modern Hindi literature in social and environmental contexts and need for sustainable development.

UNIT -I

1. Asha – (Jayashankar Prasad)

2. Tum Logon se Door (Nagarjun)

3. Literary Trends of Chayavaad

UNIT - II

1. Kavi Aur Kalpana – (Dhramaveer Bhaarathi)

2. Bharat Ki Aarthi - (Shamsher Bahadhur Singh)

3. Literary Trends of Pragathivaad

UNIT - III

1. Varadan Mangoonga Nahi (Siva Mangal Singh Suman)

2. Anevalon Se Ek Savaal (Bharat Bhooshan Agarwal)

3. Literary Trends of Nayee Kavita

UNIT –IV

1. Literary Trends of Hindi Short Stories

2. Literary trends of Hindi One Act Plays

UNIT- V

1. Maithili Saran Gupta, Jayashankar Prasad, Nirala,

2. Mahadevi Varma, Panth, Dinakar, Premchand,

3. Yashpaal Jainendra Kumar, Mohan Rakesh,

1. Modern Poetry

Prescribed Text Book : Selections in Poetry

University Publications, University of Madras .

Reference Books :

1. Hindi Sahithya Ka Itihas

By: Ramchandra Shukla , Jayabharathi Publications, 217, B, Maya Press Road,

Allahabad– 211 003.

2. Hindi Sahithya Yug Aur

Pravrithiya By:

Dr. Sivakumar Varma,

Asok Prakashan Nayi Sarak, New Delhi – 6

3. Hindi Sahithya ka SybodhItihas

By : Babu Gulabroy, Lakshmi Narayanan Agarwas Book Publishers seller,Anupama

Plaza-1, Block.No.50, Sanjay Place, Agra- 282002.

LANGUAGE THROUGH LITERATURE - II

SEMESTER IV	Subject Title	Subject Code	Total Hours	Credit
	Language through Literature - II		60	3

COURSE OBJECTIVE:

1. To use literature as a medium to teach/learn grammar, reading, spelling, vocabulary, writing mechanics, creative writing and thinking skills
2. To strengthen contextual understanding of the language through texts relevant to specific disciplines and offer scope for imaginative involvement and self-expression
3. To stimulate interest in acquiring twenty first century skills
4. To engage in self-assessment activities for self- development
5. To help absorb the values, ethics and attitudes of life and culture expressed in literature

LEARNING OUTCOMES:

After completing the course, the students will be able to

1. Reveal the extent of enhancement of their vocabulary and use them appropriately to communicate in contexts
2. Become aware of commonly occurring errors and avoid committing them inlanguage use
3. Rewrite words and sentences by changing their forms and use them appropriately.
4. Show improvement in their pronunciation.
5. Attempt different kinds of writing – essays, emails, blogs, letters etc.
6. Prepare resumes to face interviews.
7. Convert short stories into plays or skit.
8. Role play the scenes and make a dramatic presentation of the scenes.
9. Create a webpage for themselves and others.
10. Show their awareness of contemporary issues and themes that are sociallyrelevant by reading texts of different literary genres.

SYLLABUS:

UNIT 1 : History Makers			
THEME	**TEXTS**	**WRITING SKILLS**	
	1.1 My Experience with ALS **By Stephen Hawking**	➢ **Gathering details and information – Brainstorming** ➢ **Listing events and experiences** ➢ **Creating Mind Map** ➢ **Pre-Writing, Writing and Rewriting/ Revising**	
	1.2 Vikram Sarabhai	**Writing** **Autobiographical and Memoirs** **(Writing about one's own personality)** ➢ **Biographical, personalities**	

UNIT 2 : Self Help Essays			
THEME	**TEXTS**	**Writing about Life experiences and events| (Writing based on facts)**	
	2.1 Attitude **by Margaret Atwood**	➢ **Journal Writing** ➢ **Social events** ➢ **Festivals** ➢ **Sports** ○	
	2.2 Creativity	➢ **Travel writing ,**	

	By Edward de Bono.	➢ **Preparing Itineraries** ➢ **Natural calamities,** ➢ **Environment**	
UNIT 3 : Contemporary Writings from India			
THEME	**TEXTS**	**Critical / Analytical Writing**	
	3.1 The Future of jobs **By Amitabh Kant**	➢ **Reading and analysing Media reports** ➢ **Social Media Posts and comments**	
	3.2 Education and the English Language **By Shashi Tharoor**	➢ **Film review** ➢ **Writing opinions** ➢ **Appraisal**	

Unit 4: Regional Indian Literature in Translation			
THEME	**TEXTS**	**ENGLISH LANGUAGE SKILLS** **Critical / Analytical Writing**	
	POETRY **4.1 Those who have lost the Nectar** **by O N V Kurup** **(** Translated from Malayalam by S. Velayudhan)	➢ **Translation** ➢ **Short poems – acrostics etc** ➢ **Critique/ Culture study**	
	4.2 "Some People Laugh, Some People Cry" **by Sri Srinivasa Rao** (Translated from Telugu by V. Narayana Rao and A. K. Ramanujam)	➢ **Fill in the story ,** ➢ **expanding stories,** ➢ **rewriting tales** ➢ **Comic strips and cartoons**	
	4. 3 **The Rogue by Atulananda Goswami.** (Translated from Assamese by the author)		
	SHORT STORY		

	4.4The Holy Panchayat **by Premchand** (Translated from Hindi by Reshme Sehgal)		
	4.5 The Card-Sharper's Daughter by V. M. Basheer **(** Translated from Malayalam by K. M. Sheriff)		
UNIT 5 : Fiction			
THEME	**TEXTS**	**Writing about Life experiences and events| (Writing based on facts)**	
	The White Tiger **By Aravind Adiga** **Harper Collins Publishers**	➢ **Creative writing** ➢ **Critical thinking**	

PAPER - VI GENERAL CHEMISTRY - IV

SEMESTER IV	Subject Title	Subject Code	Total Hours	Credit
	PAPER - V GENERAL CHEMISTRY - IV	SD24A	75	4

Learning Objectives

1. Students will learn the chemistry of redox reactions
2. Understanding the General characteristics of d-Block elements
3. Learning the preparation and properties of Heterocyclic compounds and dyes.
4. Understanding the nomenclature, preparation and properties of alcohols, thiols, ethers and thioethers.
5. Understanding the limitation of I law of thermodynamics and the need of II law of thermodynamics**.**

UNIT I: CHEMISTRY OF REDOX REACTIONS (10 hrs)

Covalency- oxidation number- oxidation state - difference between oxidation number and valency-rules for calculating oxidation number - definition of oxidation and reduction - redox reactions and half reactions - oxidising agents and reducing agents - equivalent weights of oxidising and reducing agents - auto oxidation and induced oxidation - balancing of redox equations by oxidation number method and ion-electron method

UNIT II: CHEMISTRY OF d- BLOCK ELEMENTS (15 hrs)

Transition Elements - Electronic configuration - General periodic trend –Atomic and ionic radii, metallic character, melting and boiling points, ionisation energy, oxidation state, reactivity, colour and tendency to form complexes- Group study of Titanium, Vanadium, Chromium, Manganese, Iron, Cobalt, Nickel and Zinc groups - galvanization, Evidences for the existence of mercurous ion as Hg_2^{2+}.

UNIT III: HETEROCYCLIC COMPOUNDS AND DYES (15 hrs)

3.1 Hetero cyclic compounds (15hrs)

Nomenclature, Preparation, properties and reactions of Furan, Pyrrole, Thiophene and Pyridine.Comparative study of basicity of pyrrole and pyridine with aliphatic amines. Synthesis and reactions of Indole, Quinoline and Isoquinoline

3.2 Dyes

Theory of colour and constitution. Preparation and uses of: Azo dye - Bismark brown, Triphenyl methane dye - malachite green, phthalein dye - fluorescein,anthrquinone dye-alizarin and vat dye-indigo.

UNIT IV:

4.1 ALCOHOLS AND THIOLS (15hrs)

Monohydric, dihydric (Ethylene glycol) andtrihydric (Glycerol) alcohols: Nomenclature, preparation of alcohols from alkenes, alkyl halides, Grignard reagent and carbonyl compounds. Reactions of alcohols-Dehydration, oxidation, action of Grignard reagent, dehydrogenation using copper and esterification.

Thiols: Nomenclature, structure, preparation and properties

4.2 ETHERS AND THIOETHERS

Ethers: Nomenclature, structure, preparation, properties and uses of dimethyl ether, diethyl ether, ethyl methyl ether, anisole and phenetole.

Thioethers: Nomenclature, structure, preparation, properties and uses.

UNIT5: THERMODYNAMICS-II (20hrs)

Second Law of Thermodynamics - Limitations of first law & Need for the second law - Different statements of the law - Carnot's cycle and efficiency of heat engine-Carnot's theorem- Concept of Entropy - Definition and physical significance of entropy - Entropy as a function of P, V and T-Entropy changes during phase changes - Entropy of mixing- Gibb's free energy (G) and Helmholtz free energy (A) - Variation of A and G with P, V and T - Gibb's Helmholtz equation and its applications - Thermodynamic equation of state - Maxwell's relations.

TEXT BOOKS

1. Puri B.R., Sharma L.R. and Pathania M.S., Principles of Physical Chemistry, 44th ed., New Delhi, Vishal Publishing Co., 2009.
2. Puri B.R., Sharma L.R. and Kalia K.C., Principles of Inorganic Chemistry, 30th ed., New Delhi, Milestone Publishers and Distributors, 2009.
3. Soni P.L., and Chawla H.M., Textbook of Organic Chemistry, 29th ed., New Delhi, Sultan Chand & Sons, 2007.
4. Jain M.K, Sharma S.C. Modern Organic Chemistry, Vishal Publishing Co., 2018

BOOKS FOR REFERENCES

1. Glasstone S. And Lewis D., Elements of Physical Chemistry, 2nd ed., MacMillan & Co. Ltd., London.
2. Morrison R.T. and Boyd R.N., Organic Chemistry, 6th ed. Pearson Education, Asia, 2002
3. Bahl B.S. and ArunBahl, Advanced Organic Chemistry, 12th ed., Sultan Chand & Co., New Delhi, 1997.
4. Madan R.D. SathyaPrakash's Modern Inorganic Chemistry, 2nd ed., S.Chand& Co. Ltd, New Delhi, 1990.

Learning Outcomes

1. Learnt the chemistry of redox reactions in detail and the process of electroplating techniques like gold plated jewellery and separation of metals from ores

2. Understood the General characteristics of d-Block elements
3. Students studied the preparation and properties of heterocyclic compounds and dyes and they learnt agrochemicals, pharmaceuticals, veterinary products etc. these are also used in sanitizers, developers, anti-ordinates, corrosion inhibitors etc.
4. Understood the nomenclature, preparation and properties of alcohols, thiols, ethers and thioethers.
5. Learnt the limitation of I law of thermodynamics and the need of II law of thermodynamics.

CORE-VI: MAJOR PRACTICAL - II **BCY-DSC06**

SEMESTER IV	Subject Title	Subject Code	Total Hours	Credit
	SEMI-MICROQUALITATIVE ANALYSIS		**90**	3

Semi-Micro Qualitative Analysis

1. Analysis of simple acid radicals: carbonate, sulphate, chloride, bromide, iodide, nitrate.
2. Analysis of interfering acid radicals:Fluoride, oxalate, borate, phosphate.
3. Elimination of interfering acid radicals and Identifying the groups of basic radicals.
4. Analysis of basic radicals (group-wise): Lead, copper, bismuth, cadmium, iron, aluminium, zinc, manganese, nickel, cobalt, calcium, strontium, barium, magnesium, ammonium.
    a. Analysis of a mixture containing two cations and two anions (of which one is interfering type)
5. Each student is expected to do the analysis of at least 10 mixtures.

BOOK FOR REFERENCE

1. Venkateswaran V, Veeraswamy R., Kulandivelu A.R., Basic Principles of Practical Chemistry, 2nd edition, New Delhi, Sultan Chand & Sons (1997)

LEARNING OUTCOMES

1. Students will have a firm foundation in the fundamentals and application of current chemical and scientific theories.
2. Students will be able to understand and carry out scientific experiments as well as accurately record and analyse the results.
3. Students will appreciate the central role of chemistry in our society and use this as a basis for ethical behavior in issues facing chemists including an understanding of safe handling of chemicals, environmental issues and key issues facing our society in energy, health and medicine.

ALLIED PHYSICS-II (THEORY)

(For B.Sc., Mathematics, Chemistry and Computer Science students)

SEMESTER IV	Subject Title	Subject Code	Total Hours	Credit
	ALLIED PHYSICS-II (THEORY)	SR3AB	60	3

COURSE OBJECTIVE:

This paper introduces the student to the basic concepts of current electricity, electronics and digital electronics.

LEARNING OUTCOME:

- Acquire knowledge on elementary ideas of electricity and magnetism
- Emphasize the significance of laws involved in electric circuits
- Understand the basics of operational amplifier
- Apply the principles of electronics in day to life
- Apply the characteristics of electronic devices in practicals.

UNIT I: CURRENT ELECTRICITY

Ohm's law – Law of resistance in series and parallel – Specific resistance – capacitors – capacitors in serial and parallel – Kirchoff's laws – Wheatstone's network – condition for balance

Carey-Foster's bridge – measurement of resistance – measurement of specific resistance –determination of temperature coefficient of resistance – Potentiometer – calibration of Voltmeter.

UNIT II: ELECTROMAGNETISM

Electromagnetic Induction – Faraday's laws – Lenz law – Self Inductance – Mutual Inductance – Experimental Determination-Coefficient of Coupling

A.C. Circuits – Mean value – RMS value – Peak value – LCR in series circuit – impedance – resonant frequency – sharpness of resonance.

UNIT III: Atomic and Nuclear Physics

Bohr's atom model – radius energy – Atomic excitation – Ionization potential – Frank and Hertz Method – Nucleus – Nuclear properties – Mass defect – Binding energy.

Radio isotopes – Uses of radio isotopes – Nuclear fusion and Nuclear fission – X-rays – Production – properties –Derivation of Bragg's law – uses of X-raysin industrial and medical fields.

UNIT IV: Analog Electronics

Semiconductor – PN junction diode – Bridge rectifier – Zener diode – Regulated power supply.

Transistor – Working of a transistor – Transistor characteristics: CE Configuration – current gain relationship between ⟨ and ® – Transistor Characteristics – CE Configuration only – CE amplifier – feedback – Hartley oscillator – Colpitt's oscillator.

UNIT V: Digital Electronics

Number system – Decimal – Binary – Octal and Hexadecimal system – Double Dabble method – Binary addition, subtraction and multiplication– conversion of binary number to octal and hexadecimal numbers and vice versa.

Logic gates – OR, AND, NOT, XOR, NAND and NOR gates – truth tables – Half adder and Full adder circuits – Laws and theorems of Boolean's algebra – De Morgan's theorems.

Books for Study:

1. Electricity and Magnetism – R. Murugesan, S. Chand & co, 2001.
2. Modern Physics – R. Murugesan, S. Chand & co, 1998.
3. Basic Electronics – B.L. Theraja, S. Chand & co, 2003.

TSSED - ESSENTIALS OF SPOKEN & PRESENTATION SKILL - LEVEL II

SEMESTER IV	Subject Title	Subject Code	Total Hours	Credit
	ESSENTIALS OF SPOKEN & PRESENTATION SKILL - LEVEL II	**TSSED**	30	2

LEARNING OBJECTIVES:

The main objectives of this course are

1. To help the students understand the role of kinesics and other paralinguistic elements in enriching their presentation skills.
2. To improve their skills in teamwork and group discussions.
3. To equip them with skills needed to face interviews and make effective presentations.

LEARNING OUTCOME:

After completing this course, the students would have

1. Learnt the importance of paralinguistic elements in enhancing their presentation
2. Learnt to work as a team, conduct and participate in group discussions
3. Face interviews and face presentations effectively.

SYLLABUS:

UNIT 1:

- Body Language - Kinesics
- Proxemics
- Para linguistic
- Chronemics
- Nuances of Speech Delivery
- Personality Development: Building self-esteem

UNIT II:

- Team work and participating in group discussions
- Team building and Team work
- Team briefing
- Role of Team leader
- Conflict resolution
- Methodology of Group discussions
- Role Functions in Group Discussion
- Types of Non-functional behaviour
- Improving group performance
- Participating in Mock group discussions

UNIT III:

- Interviews
- Types of Interviews
- preparing for interviews
- facing interviews
- reviewing performance
- participating in mock interviews

UNIT IV:

- Business Presentations
- Preparing successful presentations
- thinking about audience
- making effective use of visual aid
- Delivering presentation
- using prompts
- dealing with questions and interruptions
- Mock presentations

ALLLIED PHYSICS –PRACTICALS
(At the end of even Semester - Any Fifteen Experiments) Credits:4

ALLIED PHYSICS-I & II – (PRACTICALS)
(At the end of even Semester - Any Fifteen Experiments)

SEMESTER IV	Subject Title	Subject Code	Total Hours	Credit
	ALLIED PHYSICS-II (PRACTICALS)	**SR3A1**	90	4

Learning Objective:

- Will learn the strength of the material.
- Will learn about the frequency of a.c mains

1. Young's Modulus by Non-uniform bending using Pin and Microscope
2. Young's Modulus by Non-uniform bending using Optic lever–Scale and telescope
3. Rigidity modulus by Static torsion method.
4. Rigidity modulus by Torsional oscillations without mass
5. Surface tension and Interfacial Surface tension–Drop Weight method
6. Comparison of Viscosities of two liquids–Burette method
7. Specific heat Capacity of a liquid–Half time correction
8. Sonometer–Determination of a.c frequency
9. Newton'srings-Radiusof curvature
10. Airwedge–Thicknessofawire.
11. Spectrometer–Grating–WavelengthofMercurylines–Minimum deviation method
12. Potentiometer–VoltmeterCalibration
13. P.O. Box–Specific resistance
14. B.G.–Figureof Merit (table galvanometer)
15. Construction of AND, OR, NOT gates–using diodes and Transistor
16. Zener Diode–Characteristics
17. NAND gate as a universal gate

Note: Use of Digital Balance Permitted

Book for Reference

1. Venkateswaran V, Veeraswamy R., Kulandivelu A.R., Basic Principles of Practical Chemistry,
2. 2nd edition, New Delhi, Sultan Chand & Sons (1997).

ENVIRONMENTAL STUDIES

SEMESTER IV	Subject Title	Subject Code	Total Hours	Credit
	ENVIRONMENTAL STUDIES	**ENV4B**	60	2

LEARNING OBJECTIVES

1. To create the awareness about environmental problems
2. To develop an attitude of concern for the environment
3. Understand the process of on ecosystem, animals and human health
4. To provide every person with opportunities to acquire the knowledge, values,
5. attitudes, commitment and skills needed to protect and improve the environment**.**

LEARNING OUTCOME

1. Understood the foundational concepts of environmental science and they learnt the
2. interaction between organism and their environments drive the dynamics of
3. individuals, populations, communities and ecosystem.
4. They learnt the ecological basis for regional and global environmental issues.
5. Understood the historical and social context of environmental science thought and
6. research and the contributions of environmental science to the resolution of ethical, social and environmental issues in human affairs.
7. Learnt integrate facts, concepts and methods from multiple disciplines and apply to environmental **problems.**

UNIT 1: INTRODUCTION TO ENVIRONMENTAL STUDIES

- Multidisciplinary nature of environmental studies;
- Scope and importance; concept of sustainability and sustainable development.

UNIT 2 : ECOSYSTEM (2 LECTURES)

- What is an ecosystem? Structure and function of ecosystem; Energy flow in an ecosystem:

Food chains, food webs and ecological succession, Case studies of the following ecosystem:

a) Forest ecosystem

b) Grassland ecosystem

c) Desert ecosystem

d) Aquatic ecosystem (ponds, stream, lakes, rivers, ocean, estuaries)

UNIT 3:

NATURAL RESOURCES: RENEWABLE AND NON – RENEWABLE (6 lectures)

- Land resources and landuse change: Land degradation, soil erosion and desertification.
- Deforestation: Causes and impacts due to mining, dam building on environment, forests, biodiversity and tribal populations.
- Water: Use and over –exploitation of surface and ground water, floods, droughts, conflicts over water (international and inter-state).
- Energy resources: Renewable and non renewable energy sources, use of alternate energy sources, growing energy needs, case studies.

UNIT 4: BIODIVERSITY AND CONSERVATION (8 LECTURERS)

- Levels of biological diversity: genetics, species and ecosystem diversity, Biogeographic zones of India: Biodiversity patterns and global biodiversity hot spots
- India as a mega- biodiversity nation, Endangered and endemic species of India.
- Threats to biodiversity: Habitat loss, poaching of wildlife, man- wildlife conflicts, biological invasions; Conservations of biodiversity: In-situ and Ex-situ Conservation of biodiversity.
- Ecosystem and biodiversity services: Ecological, economic, social, ethical, aesthetic and Informational value.

UNIT 5: ENVIRONMENTAL POLLUTION (8 LECTURERS)

- Environmental pollution: types, causes, effects and controls: Air, Water, soil and Noise Pollution.
- Nuclear hazards and human health risks
- Solid waste management: Control measures of urban and industrial waste
- Pollution case studies.

UNIT 6: ENVIRONMENTAL POLICIES & PRACTICES (8 LECTURERS)

- Climate change, global warming, ozone layer depletion, acid rain and impacts on human communities and agriculture
- Environment Laws: Environment Protection Act, Air (Prevention & Control of Pollution) Act; Water (Prevention and Control of Pollution) Act; Wildlife Protection Act; Forest Conservation Act. International agreements: Montreal and Kyoto protocols and Convention on Biological Diversity (CBD).
- Nature reserves, tribal populations and rights, and human Wildlife conflicts in Indian context.

UNIT 7: HUMAN COMMUNITIES AND THE ENVIRONMENT (7 LECTURES)

- Human population growth, impacts on environment, human health and welfare.
- Resettlement and rehabilitation of projects affected persons; case studies.
- Disaster management: floods, earthquake, cyclone and landslides.
- Environmental movements : Chipko, Silent Valley, Bishnois of Rajasthan.
- Environmental ethics : Role of Indian and other religions and cultures in environmental conservation.
- Environmental communication and public awareness, case studies(e.g. CNG Vehicles in Delhi)

UNIT 8: FIELD WORK (6 LECTURES)

- Visit to an area to document environmental assets: river / forest/ flora/ fauna etc.

- Visit to a local polluted site – Urban / Rural/ Industrial/ Agricultural.
- Study of common plants, insects, birds and basic principles of identification.
- Study of simple ecosystem- pond, river, Delhi Ridge etc.

(Equal to 5 Lectures)

SUGGESTED READINGS:

1. Carson , R. 2002.Slient Spring, Houghton Mifflin Harcourt.
2. Gadgil , M.,& Guha, R. 1993.This Fissured Land: An Ecological History of India.Univ.of California Press.
3. Glesson, B. and Low, N.(eds.)1999. Global Ethics and Environment, London,

ROUTLEDGE.

1. Gleick,P.H.1993.Water Crisis. Pacific Institute for Studies in Dev.,Environment & Security. Stockholm Env.Institute, Oxford Univ.Press.
2. Groom, Martha J., Gary K.Meffe, and Carl Ronald Carroll. Principles of Conservation Biology. Sunderland: Sinauer Associates,2006.
3. Grumbine,R.Edward, and Pandit,M.K2013.Threats from India's Himalayas dams .Science,339:36-37
4. McCully,P.1996.Rivers no more :the environmental effects of dams(pp.29-64).Zed books.
5. McNeill,John R.2000.Something New Under the Sun: An Environmental History of the Twentieth Century.
6. Odum,E.P.,Odum, H.T.& Andrees,J.1971.Fundamental of Ecology. Philadelphia Saunders.
7. Pepper,I.L.,Gerba,C.P & Brusseau,M.L.2011.Environmental and Pollution Science. Academic Press.
8. Rao,M.N.& Datta,A.K1987.Waste Water Treatment. Oxford and IBH Publishing Co.Pvt.Ltd.
9. Raven,P.H.,Hassenzahl,D.M & Berg,L.R.2012 Environment.8th edition. John Willey &sons.osencranz,
10. A., Divan,S.,& Noble, M.L.2001.Environmental law and policy in India. Tirupathi 1992.
11. Sengupta,R.2003.Ecology and Economics: An approach to sustainable development.OUP
12. Singh,J.S.,Singh,S.P and Gupta,S.R.2014.Ecology,Environmental Science and Conservation. S.Chand Publishing, New Delhi.
13. Sodhi,N.S.,Gibson,L.&Raven ,P.H(eds).2013.Conservation Biology :Voices from the Tropics. John Willey & Sons.
14. Thapar,V.1998.Land of the Tiger: A Natural History of the Indian Subcontinent.

Warren,C.E.1971.Biology and water Pollution Control. WB Saunders.
15. Willson,E.O.2006. The Creation: An appeal to save life on earth..New York: Norton.
World Commission on Environment and Development.1987.Our Common Future.Oxford University Press.

FIFTH SEMESTER

(WITH EFFECT FROM THE ACADEMIC YEAR 2017-2018)

REVISED REGULATIONS AND SYLLABUS FOR III YEARS

THIS REVISED SYLLABUS AND SCHEME OF EXAMINATIONS WILL TAKE EFFECT FOR THE STUDENTS ADMITTED FROM THE ACADEMIC YEAR 2017-18 ONWARDS.

Paper VII – INORGANIC CHEMISTRY I

Semester V	Subject Title	Subject Code	Total Hours	Credit
	PAPER VII INORGANIC CHEMISTRY – I	BCY-DSC07	60	4

LEARNING OBJECTIVES

1. Learning the unique characteristics of lanthanide and actinide series
2. Learning the fundamentals of coordination chemistry and its applications in analytical chemistry, understanding the biological importance of complexes
3. Learning the theories of acids and bases

LEARNING OUTCOMES:

1. The learner understands the characteristic properties of lanthanides and actinides and their extraction from ores. Students learn about the importance and application of lanthanides and actinides in day to day life.
2. Understands the fundamental theories of coordination compounds, their naming and applications.
3. Understands the structure of biologically important of coordination complexes like haemoglobin, chlorophyll and vitamin b complex.
4. Helps the students to understand the principle and technique utilised in estimating hardness of water.
5. Various theories defining acids and bases are understood in detail by the student.
6. Students are able to apply the theories of acid and bases to understand the feasibility of inorganic, organic reactions and also the stability of complexes.

UNIT I: CHEMISTRY OF f-BLOCK ELEMENTS (15 hrs)

General characteristics of f-block elements – Comparative account of lanthanides and actinides – Occurrence, Oxidation states, Magnetic properties, Colour and spectra – Lanthanides and Actinides Separation by ion-Exchange and Solvent extraction methods – Lanthanide contraction-Chemistry of thorium and Uranium-Occurrence, Ores, Extraction, properties and uses – Preparation, Properties and uses of ceric ammonium sulphate, thorium dioxide and uranyl acetate.

UNIT II: COORDINATION CHEMISTRY (15 hrs)

Types of ligands,IUPAC Nomenclature, Isomerism – Ionisation, hydrate, linkage, ligand and coordination isomerism. Stereoisomerism-geometrical and optical isomerism in 4 & 6 coordinated complexes. Theories of coordination compounds – Werner's and Sidgwick's EAN concept, Valence Bond theory – hybridisation, geometry and magnetic properties of $[Ni(CN)_4]^{2-}$, $[NiCl_4]^{2-}$, $[Fe(CN)_6]^{4-}$, $[Co(NH3)_6]^{3+}$ and $[CoF_6]^{3-}$. Crystal field theory – spectrochemical series, splitting of d- orbitals in octahedral and tetrahedral complexes, low spin & high spin complexes. Explanation of colour and magnetic properties using CFT, comparison of VBT and CFT.

UNIT III: APPLICATION OF COORDINATION COMPOUNDS (12 hrs)

Application of coordination compounds – Estimation of nickel using DMG and aluminium using oxine . Estimation of hardness of water using EDTA . Biologically important coordination compounds - Chlorophyll, haemoglobin, vitamin - B_{12} (their structure and applications). Metal Carbonyls : Mono and Poly nuclear Carbonyls of Ni, Fe, Cr, Co and Mn – Synthesis, structures and bonding.

UNIT IV: CHEMISTRY OF BINARY COMPOUNDS (10 hrs)

Classification, preparation, properties and uses of hydrides, borides, carbides and nitrides

UNIT V: CONCEPTS OF ACIDS AND BASES (8 hrs)

Theories of acids and bases – Arrhenius theory, Bronsted – Lowry theory – basicity of an acid and acidity of a base – relative strengths of acids and bases, Cady – Esley concept - general theory of solvent system, Lux – Flood concept, Lewis concept – Lewis acids – bases concept in coordination chemistry – classification of Lewis acids, Usanovich concept. Concept of Hard and Soft Acids and Bases (HSAB).

TEXT BOOK

Puri B.R., Sharma L.R. and Kalia K.C., Principles of Inorganic Chemistry, 33rd ed., New Delhi,Mile stone publishers and distributers, 2016.

BOOKS FOR REFERENCE

1. Lee J.D., Concise Inorganic Chemistry, 5th ed., Blackwell Science, 2005.

2. Sharpe Alan G. Inorganic Chemistry, ELBS and Longman,1981.

3. Soni P.L., and Mohan katyal, Text book of Inorganic Chemistry, 20th ed., S.Chand& Co., New Delhi, 2006.

4. Malik Wahid U., Tuli G.D. and Madan R.D., Selected Topics in Inorganic Chemistry, 7th ed., S.Chand& Company Ltd., New Delhi, 2007.

5. James E.Huheey, Ellen A.Keiter, Richard L.Keiter and OkhilK.Medhi, Inorganic Chemistry: Principles of Structure and Reactivity, 4th ed., Pearson India, 2011.

6. Gurdeep Raj Chatwal and Harish Mehre, Advanced Inorganic Chemistry, 7th ed., Goel Publishing House, Meerut.

Paper VIII – ORGANIC CHEMISTRY I

Semester V	Subject Title	Subject Code	Total Hours	Credit
	PAPER - VIII ORGANIC HEMISTRY --I	BCY-DSC08	60	4

LEARNING OBJECTIVES

1. Understanding acidic nature of phenol and its properties
2. Learning the reactions of aldehydes and ketones
3. Learning the Chemistry of carboxylic acids and their derivatives
1. Learning the Chemistry of nitro compounds and amines
2. Learning the Chemistry of aromatic halides and sulphonic acids

LEARNING OUTCOMES

1. The acidic nature of Phenols, its stability due to resonance and its properties were understood. The use of phenol in manufacture of household products and as intermediates for industrial synthesis was understood well.
2. The synthesis, physical and chemical properties and name reactions of Carbonyl compounds were learnt. The importance of reactions taking place inside living cells pertaining to carbonyl compounds by way of maintenance of life was well taught.
3. Chemistry of carboxylic acids, acid derivatives and synthetic applications of acetoacetic ester and malonic ester were understood. The use of these compounds in the production of polymers, biopolymers and pharmaceutical drugs was learnt by the students.
4. Chemistry behind nitro compounds that are widely used as chemical feedstock and used for synthesis of medicines, dyes, fertilizers and plastics was learnt. Reactions of amines and its use in textile industry was understood well.
5. Nomenclature of halides and sulphonic acids were learnt. Derivatives of sulphon**ic** aids such as Na ion and its use in fuel cells was discussed.

UNIT-I: CHEMISTRY OF PHENOLS AND AROMATIC ALCOHOLS (12 hrs)

Phenols: Nomenclature, synthesis of phenol from benzene sulphonic acid, chlorobenzene and cumene.- Properties – Acidity of phenols (explanation on the basis of resonance stabilization). Reactions similar to those of alcohols, ring substitution in phenol-orientation of phenolic group towards electrophiles, halogenation, nitration and sulphonation, **Libermann's nitroso reaction,** Riemer-Tiemann reaction, Kolbe-Schmidt reaction and coupling with diazonium salts and condensation reactions.Dihydric phenols and benzyl alcohols-preparation, properties and uses

UNIT-II: CHEMISTRY OF CARBONYL COMPOUNDS. (15 hrs)

Nomenclature, structure of carbonyl compounds, acidity of alpha-hydrogen atom, keto-enol Tautomerism (proof for the two forms). Mechanism of nucleophilic addition with HCN, ROH, $NaHSO_3$, ammonia and its derivatives. Mechanism of Meerwein-Pondorf Verley reduction, Clemmenson reduction, Wolf-Kishner reduction, aldol condensation, Claisen-Schmidt reaction, Cannizaro reaction, haloform reaction, Perkin and Benzoin condensation reaction.

UNIT-III: CHEMISTRY OF CARBOXYLIC ACIDS AND THEIR DERIVATIVES (12 hrs)

Acidity of carboxylic acids, Effect of substituents on acidity, comparison of acid strengths of halogen substituted acetic acid and substituted benzoic acid.

Dicarboxylic acids: Preparation – from alkyl cyanides, cyclic ketones and halo esters. Reactions – action of heat, action of PCl_5 and NH_3.

Acid derivatives (Aliphatic): Synthesis and important properties of acid derivatives (acid chlorides, acid anhydrides, esters and amides). Acetoacetic and malonic esters-Preparation and synthetic applications.

UNIT-IV: CHEMISTRY OF NITROGEN COMPOUNDS (12 hrs)

Nitrobenzene-preparation, reduction in different media, conversion of nitrobenzene to m-dinitrobenzene and TNT. Amines: Nomenclature, Basicity of amines, effect of substituents on basicity of aliphatic and aromatic amines. Preparation-primary amines-(Gabriel synthesis and reduction of nitriles), secondary and tertiary amines-by the reduction of N-alkyl substituted amides.

Reactions of amines-primary aliphatic and aromatic amines with nitrous acid.

UNIT – V: AROMATIC HALIDES AND SULPHONIC ACIDS (9 hrs)

Aryl halides – Nomenclature, preparation, physical and chemical properties. Benzoyl chloride – Preparation, Physical and chemical properties.

Nomenclature of aromatic sulphonic acids – preparation and properties of aromatic sulphonic acids – benzene sulphonyl chloride, saccharin chloramine-T, sulphanilic acid and sulfanilamide

TEXT BOOKS

1. Arun Bahland Bahl B.S., A Text book of Organic Chemistry, S.Chand Publishing, 2016.

2. Soni, P.L., and Chawla H.M., Text book of Organic Chemistry, 29 th ed., New Delhi, Sultan Chand & Sons, 2007.

REFERENCE BOOKS:

1. Morrison, R.T. and Boyd R.N., Organic Chemistry, 6 th ed., Pearson Education, Asia 2002.

2. Graham Solomons, T.W.Organic Chemistry, 3 rd ed., John Wiley & Sons.

3. Carey Francis A., Organic Chemistry , 7th ed., New Delhi, Tata MacGraw Hill Education pvt Ltd., 2009.

4. Finar I.L., Organic Chemistry, 6th, Vol.(1& 2), England, Wesley Longman Ltd. 1996.

5. John E. McMurry, Organic Chemistry, 9th ed., Cengage Learning, 2015.

6. Agarwal O.P., Organic Chemistry Reactions & Reagents, 49th ed., Goel Publishing House, 2014.

Paper IX – PHYSICAL CHEMISTRY I

Semester V	Subject Title	Subject Code	Total Hours	Credit
	PAPER - IX PHYSICAL CHEMISTRY – I	BCY-DSC09	60	4

LEARNING OBJECTIVES

1. Introduced to concepts of thermodynamics such as equilibrium constant and entropy
2. Learning fundamental concepts about solutions and the basis of separation techniques such as steam distillation and solvent extraction
3. Introduced to phase rule and its application to one component and two component system
4. Introduced to colligative properties and methods of their determination
5. Introduced to the concept of conductance in electrochemistry.

LEARNING OUTCOMES

1. The concepts of thermodynamics such as equilibrium constant and entropy was understood clearly. The application of Le-Chatliers Principles in production of NH3SO3 was explained. Clausius-Clapeyron equation-Skating Principles.
2. The fundamental concepts about solutions and the basis of separation techniques such as steam distillation and solvent extraction was studied
3. The concept of phase rule was understood and its application to one component and two component system was studied in detail. The behaviour of a system under a particular set of conditions was discussed.
4. An introduction to colligative properties was given and methods of their determination was discussed. The salting of roads for melting ice quickly for safe driving was given as a practical application of Colligative properties.
5. The concept of conductance in electrochemistry and its application in demineralization and RO systems was studied in detail.

UNIT I: THERMODYNAMICS III (12 hrs)

Equilibrium constant and free energy change – Thermodynamic derivation of law of mass action – Equilibrium constants in terms of pressure and concentration (K_p and K_c) and their relation -

Thermodynamic interpretation of Le-Chatelier's principle (Concentration, temperature, pressure and addition of inert gases). Systems of variable composition – Partial molar quantities – Chemical potential – Variation of chemical potential with T, P and X (mole fraction) – Gibb's – Duhem equation. van't Hoff's reaction isotherm – van't Hoff's isochore – Clapeyron equation and Clausius – Clapeyron equation – Applications –

Third Law of Thermodynamics: Nernst heart theorem – Statement of third law and concept of residual entropy – Evaluation of absolute entropy from heat capacity data.

UNIT II: SOLUTIONS (12 hrs)

Ideal and Non-ideal solutions. Concept of activity and activity coefficients – Completely miscible liquid systems – benzene and toluene. Raoult's law and Henry's law. Deviation from Raoult's law and Henry's law. Duhem-Margules equation. Azeotropes – HCl-water and Ethanol-water system – Partially miscible liquid systems – phenol-water, triethylamine-water and Nicotine-water systems. Completely immiscible liquids –principle and applications of steam distillation - Nernst Distribution Law-thermodynamic derivation, application to solvent extraction, limitations of distribution law

UNIT III: THERMODYNAMICS OF PHASE CHANGES (10 hrs)

Definition of terms in the phase rule – Derivation and application to one component system water and sulphur – super cooling, sublimation. Two component systems – solid-liquid equilibria, simple eutectic (lead-silver), de-silverisation of lead –Compound formation with congruent melting point. (Mg-Zn) and incongruent melting print (Na-K). Solid solutions – (Ag-Au) de-silversation of lead– freezing mixtures – KI-H_2O system and $CuSO_4$-H_2O systems

UNIT IV: DILUTE SOLUTIONS AND COLLIGATIVE PROPERTIES (10 hrs)

Colligative properties – relative lowering of vapour pressure, osmosis – Law and osmotic pressure-isotonic solutions, effect of concentration and temperature on osmotic pressure - thermodynamic derivation of elevation of boiling point and depression in freezing point – determination molecular masses using the above properties – abnormal molecular masses and Van't Hoff factor – degree of association and degree of dissociation.

UNIT V: ELECTROCHEMICAL CONDUCTANCE (16 hrs)

Electrical transport and conductance in metal and in electrolytic solution. Specific conductance and equivalent conductance. Measurement of equivalent conductance. Using Kohlraush's bridge. Arrhenius theory of electrolytic dissociation and its limitations. Weak and strong electrolyte according to Arrhenius theory Ostwald's dilution laws– applications and limitation. Variation of equivalent conductance with concentration. Migration of ion-ionic mobility. Kohlraush's law and its applications. The elementary treatment of the Debye-Huckel Onsager equation for strong electrolytes. Evidence for ionic atmosphere. The conductance at high fields (Wein effect) and high frequencies (Debye-Falkenhagen effect). Transport number & Hittorf's rule. Determination by moving boundary method. Application of conductance measurements – Determination of Λ_0 of strong electrolytes. Determination of Ka of weak acids. Determination of solubility product of a sparingly soluble salt. Conductometric titrations.

TEXT BOOK

Puri B.R., Sharma L.R., Pathania M.S., Principles of Physical Chemistry, 47th ed., Vishal Publishing Co., 2016.

REFERENCE BOOKS

1. Atkins P.W., Physical Chemistry, 5th ed., Oxford University Press, 1994.

2. Castellan G.V., Physical Chemistry, New Delhi, Orient Longmans.

3. Levine I.N., Physical Chemistry 6th ed., 2009.

4. Rajaram J. and Kuriacose J.C.,Thermodynamics for students of chemistry 3rd ed., Shoban Lal & Co., 2013.

5. Bajpai D.N., Advanced Physical Chemistry, S. Chand Publishing, 2001.

6. Negi A.S. and Anand S.C., A Textbook of Physical Chemistry, John Wiley & Sons Pvt. Ltd., 1986.

MAJOR PRACTICAL PAPER X – GRAVIMETRIC ANALYSIS

LEARNING OBJECTIVES

1. To learn the gravimetric estimation of some anions and cations

LEARNING OUTCOMES

1. The gravimetric analysis of some anions and cations were carried out and the methodology was understood well.
2. Students learn to employ the gravimetric calculations

Semester	Subject Title	Subject Code	Total Hours	Credit
VI	**INORGANIC QUANTITATIVE ANALYSIS – GRAVIMETRIC ANALYSIS**	BCY-DSC13	90	4

The students are expected to write the procedure during examination for which marks should be awarded as per the scheme of examination

1. Estimation of Lead as Lead chromate
2. Estimation of Barium as Barium chromate
3. Estimation of Nickel as Nickel - DMG complex.
4. Estimation of Calcium as Calcium oxalate
5. Estimation of Barium as Barium sulfate
6. Estimation of sulfate as Barium sulfate.
7. Estimation of Aluminium as Aluminium oxinate (for demonstration)
8. Estimation of Silver as Silver chloride (for demonstration)

BOOKS FOR REFERENCES

1. Venkateswaran, V. Veeraswamy R. Kulandaivelu A.R., Basic Principles of Practical Chemistry, 2nd Edition, New Delhi, Sultan Chand & Sons, (1997).
2. Jeffery G.H., Bassett J., Mendham J. And Denney R.C, Vogel's Text book of Quantitative Chemical Analysis, 5th ed., John Wiley & Sons Inc., New York, 1989.

MAJOR PRACTICAL PAPER XI– ORGANIC ANALYSIS AND PREPARATION

LEARNING OBJECTIVES

1. Learning to identify functional groups and element present in organic compounds

2. Preparation of some simple organic compounds

LEARNING OUTCOMES

1. The element and functional group present in the sample given for analysis was identified.
2. Simple organic compounds were prepared.

ORGANIC ANALYSIS AND PREPARATION

Semester	Subject Title	Subject Code	Total Hours	Credit
VI	**ORGANIC ANALYSIS AND PREPARATION**	BCY-DSC14	90	4

ORGANIC ANALYSIS

Analysis of simple organic compounds (a) characterization functional groups (b) confirmation by preparation of solids derivatives / characteristics colour reaction.

Note: 1. Mono - functional compounds are given for analysis. In case of bi-functional compounds, students are required to report any one of the functional groups.

2. Each student is expected to do the analysis of at least 15 different organic substances.

Recommended to adopt micro scale technique of organic analysis

ORGANIC PREPARATIONS

Preparation of Organic compounds involving the following chemical conversions

1. Oxidation 2. Reduction 3. Esterification 4. Acetylation 5. Hydrolysis 6. Nitration 7. Bromination 8. Diazotization 9. Osazone formation.

BOOKS FOR REFERENCE

1. Venkateswaran V., Veeraswamy R. and Kulandaivelu A.R.,

Basic Principles of Practical Chemistry, 2nd ed., New Delhi, Sultan Chand & Sons (1997)

3. Furniss, B.S., et al. Vogel's Textbook of Practical Organic Chemistry, 5th ed., Prentice Hall, 1989.

MAJOR PRACTICAL PAPER XII – PHYSICAL CHEMISTRY

LEARNING OBJECTIVES

1. To determine the order of chemical reactions
2. To do potentiometric and conductometric titrations

LEARNING OUTCOMES

1. The order of chemical reactions were studied
2. Theory behind potentiometric and conductometric titrations were understood.

Semester	Subject Title	Subject Code	Total Hours	Credit
V	**PHYSICAL CHEMISTRY PRACTICAL**	BCY-DSC15	90	4

PHYSICAL CHEMISTRY EXPERIMENTS

1. Critical Solution Temperature
2. Effect of temperature on Critical solution temperature
3. Rast method
4. Transition temperature
5. Heat of neutralization
6. Phase diagram (Simple Eutectic)
7. Kinetics of iodination of acetone
8. Kinetics of ester hydrolysis
9. Kinetics of Persulphate – Iodide reaction.
10. Viscosity
11. Partition coefficient and Equilibrium constant of $KI + I_2 \rightarrow KI_3$
12. Determination of cell constant, specific conductance and equivalent conductance of strong electrolyte.
13. Conductometric Acid – Base titration
14. Conductometric Precipitation titration.

15. Potentiometric Acid – Base titration

16. Potentiometric redox titration

BOOKS FOR REFERENCE

1. Venkateswaran, V. Veeraswamy R., Kulandaivelu A.R., Basic Principles of Practical Chemistry, 2nd ed., Sultan Chand & Sons, 1997

2. Daniels et al., Experimental Physical Chemistry, 7th ed., McGraw Hill, 1970.

3. Findlay, A., Practical Physical Chemistry, 7th ed., Longman, 1989.

4. Ahluwalia, V.K., Dingra, S. and Gulati, A. College Practical Chemistry, Orient Longman Pvt. Ltd., Hyderabad 2005.

5. Sharma, K.K. and Sharma, D.S. Introduction to Practical Chemistry, Vikas Publishing House, New Delhi, 2005).

ELECTIVE – I PHARMACEUTICAL CHEMISTRY

Semester	Subject Title	Subject Code	Total Hours	Credit
V	**PHARMACEUTICAL CHEMISTRY**	BCY-DSE1A	60	5

LEARNING OBJECTIVES

1. To understand important terminologies in pharmaceutical chemistry.
2. To study about common diseases and to study about Indian medicinal plants.
3. To get an idea about anaesthetics, antipyretic and anti-inflammatory drugs.
4. To study about composition of blood, blood grouping and cardiovascular drugs.
5. To study about the medicinal importance of inorganic compounds and anticonvulsant drugs.

LEARNING OUTCOMES

1. The important terminologies in pharmaceutical chemistry were learnt.
2. An idea about common diseases, precautions against infections, administration routes of drugs and importance of Indian medicinal plants in prevention and cure of diseases were discussed.
3. The structure and chemistry behind important drugs such as anaesthetics, antipyretics and anti-inflammatory drugs was studied.
4. The composition of blood, blood grouping, relevance of grouping in life was learnt. Different types of cardiovascular drugs and the chemistry behind the use of different types of these drugs was studied in detail.
5. The medicinal importance of inorganic compounds and anticonvulsant drugs was studied in detail.

UNIT 1 (12 HRS)

Important terminologies used in pharmaceutical chemistry – drug pharmacology, pharmacognosy, pharmacodynamics, pharmacokinetics, antimetabolites, pharmacopeia (BP, IP, USP), National formulary, chemotherapy, vaccines, primary immunization, synergism, antagonist LD50, ED50, therapeutic index and drug dosage.

Various sources of drugs, pharmacologically active constituents in plants. Classification of drugs, chemical –biological – mechanism of drug action – action at cellular sites. Drug receptors and biological responses. Mechanism of different types of drug action.

UNIT 2 **(12 hrs)**

Absorption of drugs – factors affecting absorption of drugs, routes of administration - local, enema, oral and external, parental routes – advantages and disadvantages –

Common diseases – infective diseases insect borne – air borne, and water borne. Common diseases of the respiratory system and nervous system.

Indian medicinal plants – tulsi, neem, keezhanelli.

AIDS – symptoms and prevention.

UNIT 3 **(12 hrs)**

Anaesthetics – general – ether, chloroform, ethyl chloride, halothane, nitrous oxide, local – esters – cocaine, benzococaine, procaine, amides – lignocaine, cinchocaine. Analgesics – Narcotic and synthetic

Antipyretics and anti-inflammatory agents, Antibiotics – penicillin, streptomycin, chloramphenicol, tetracyclins. Antiseptics and disinfectants – phenol and its derivatives, nitrofuran derivatives.

UNIT 4 ` **(12 hrs)**

Composition of blood – blood grouping and matching. Blood pressure – systolic and diastolic – hypertensive drugs. Diabetes – causes – hyperglycemic drugs.

Cardiovascular drugs – cardiac glycosides – anti-arrhythemic drugs, antianginal drugs, vasodialators, antipsychedelic drugs – antidepressants – sedatives and hypnotics.

UNIT 5 **(12 hrs)**

Anticonvulsant agents – Barbiturates – oxazolinediones – acetyl urea derivatives – sucinimides. Diagnostic agents for kidney function (aminohippuric acid) –for liver function (sulfobromophthalein). Lipid profile – HDL, LDL, cholesterol, and lipid lowering drugs.

Vitamins – fat soluble and water soluble – sources, biological role and deficiency conditions.

Medicinal importance of inorganic compounds – compounds of aluminium – phosphorus – arsenic – mercury and Iron. Biological importance of inorganic compounds – sodium and its compounds – potassium and its compounds – copper and its compounds.

REFERENES

1. Jayashree Ghosh, A Text book of Pharmaceutical Chemistry, 5th ed., S.Chand& Company Ltd., 2014.

2. Lakshmi.S., Pharmaceutical Chemistry, S. Chand& Sons, New Delhi, 1995.
3. Ashuttosh Kar, Medicinal Chemistry, Wiley Eastern Ltd., New Delhi, 1993.
4. Hakishan, V.K. Kapoor, Medicinal and Pharmaceutical Chemistry, VallabhPrakashan, 2012.

Elective II - POLYMER CHEMISTRY

Semester	Subject Title	Subject Code	Total Hours	Credit
V	**POLYMER CHEMISTRY**	BCY-DSE2B	60	5

LEARNING OBJECTIVES

1. To get introduced to polymers, type of polymers and mechanism of polymerization
2. To understand on the determination of molecular weight of polymers and to study about glass transition temperature
3. To study about industrially important polymers
4. To understand about the methods of degradation of polymers
5. To study about the polymer reactions.

LEARNING OUTCOMES

1. The important terminologies in pharmaceutical chemistry were learnt
2. An idea about common diseases, precautions against infections, administration routes of drugs and importance of Indian medicinal plants in prevention and cure of diseases were discussed.
3. The structure and chemistry behind important drugs such as anesthetics, antipyretics and anti-inflammatory drugs was studied.
4. The composition of blood, blood grouping, relevance of grouping in life was learnt. Different types of cardiovascular drugs and the chemistry behind the use of different types of these drugs was studied in detail
5. The medicinal importance of inorganic compounds and anticonvulsant drugs was studied in detail.

UNIT 1 **(12 hrs)**

Introduction to polymers –general characteristics of polymers in comparison with common organic compounds. Basic concept of monomers and polymers. Classification of polymers – natural and synthetic polymers. Distinction between plastics, elastomers and fibres. Types of polymers thermoplastics and thermosetting plastics. Geometrical structures of polymer molecules - microstructures – chemical structures – geometrical structures – Cross-linked polymers – stereoregular polymers

Mechanism of polymerization: chain polymerization, free radical polymerization, ionic and coordination polymerization. Polyaddition and polycondensation polymerization, ring opening and group transfer polymerization.

Unit 2 **(12 hrs)**

Molecular weight of polymers – number average, weight average and viscosity average. Determination of polymer molecular weights – Osmometry (membrane, vapour phase), Viscometry methods. Light scattering and ultra-centrifugation methods. Molecular weight and degree of polymerization – practical significance of polymer molecular weight.

Glass transition temperature – transition and associated properties – factors affecting Glass transition temperature- importance - glass transition temperature of copolymers.

Polymer crystallinity – crystallisable – effect of crystallinity on properties.

Unit 3 **(12 hrs)**

Industrially important polymers – preparation, properties, and applications. Polyethylene, polypropylene, polyamides, polyvinylchloride, polymethylmethacrylate, polyesters, polycarbonates, polyurethanes, phenol – formaldehyde, melamine – formaldehyde, polysilanes, polyaniline

Unit 4 **(12 hrs)**

Degradation of polymers by thermal – oxidative, mechanical and photodegradation methods. Polymerisation techniques – bulk, solution, suspension, emulsion, polycondensation and interfacial polycondensation.
Polymer processing – compression moulding, casting, extrusion, fibre spinning, injection moulding, thermoforming, vulcanization of elastomers.

Unit 5 **(12 hrs)**

Polymer reactions – hydrolysis, Acidolysis, Amino lysis, hydrogenation, addition, and substitution - cyclisation reactions – crosslinking reactions.

Natural polymers - Rubber, Silk, Cellulose – structure and applications

Supramolecular polymers – introduction – properties – applications.

REFERENCES

1. Billmeyer.F.W. Textbook of polymer Science, 3rd ed., John Wiley and Sons, 1984.
2. Gowariker.V.R, Viswanathan.N.V. and Sreedhar.J, Polymer Science, 3rd ed., New Age International Publishers, New Delhi, 2015.
3. Sharma.B.K, Polymer Chemistry, Goel Publishing House, Meerut, 2014.
4. Odian, G., Principles of Polymerization, 4th ed., John Wiley, 2004.

PART – IV - VALUE EDUCATION SUBJECT CODE: VAE5Q

Common for all U.G. Courses (Effective from the Academic Year 2012 – 2013)

LEARNING OBJECTIVE:

1. Value are socially accepted norms to e valuate objects, persons and situations that form part and parcel of sociality.
2. A value system is a set of consistent values and measures. Knowledge of the values are inculcated through education.
3. It contributes to forming true human being, who are able to face life and make it meaningful. There are different kinds of values like, ethical or moral values, doctrinal or ideological values, social values and aesthetic values.
4. Values can be defined as broad preferences concerning appropriate courses of action or outcomes. As such, values reflect a person's sense of right and wrong or what "ought" to be. There are representative values like, "Equal rights for all", "Excellence deserves admiration". "People should be treated with respect and dignity".
5. Values tend to influence attitudes and behaviour and help to solve common human problems. Values are related to the norms of a culture.

LEARNING OUTCOMES

1. A value system is a set of consistent values and measures. Knowledge of the values were inculcated through education.
2. Classes on Value education contributed in forming true human being, who are able to face life and make it meaningful.
3. Topics related to Human values, social evils and ethical values were learnt.

UNIT I: Value education-its purpose and significance in the present world – Value system – The role of culture and civilization – Holistic living – balancing the outer and inner – Body, Mind, and Intellectual level – Duties and responsibilities.

UNIT II: Salient values for life – Truth, commitment, honesty and integrity, forgiveness and love, empathy and ability to sacrifice, care, unity, and inclusiveness, Self-esteem and self-confidence, punctuality – Time, task and resource management – Problem solving and decision making skills – Interpersonal and Intra personal relationship – Team work – Positive and creative thinking.

UNIT III: Human Rights – Universal Declaration of Human Rights – Human Rights violations – National Integration – Peace and non-violence – Dr. A P J Kalam's ten points for enlightened citizenship – Social Values and Welfare of the citizen – The role of media in value building.

UNIT IV: Environment and Ecological balance – interdependence of all beings – living and non-living.The binding of man and nature – Environment conservation and enrichment.

UNIT V: Social Evils – Corruption, Cyber crime, Terrorism – Alcoholism, Drug addiction – Dowry – Domestic violence – untouchability – female infanticide – atrocities against women – How to tackle them.

BOOKS FOR REFERENCE :

1. M.G. Chitakra: Education and Human Values, A.P.H. Publishing Corporation, New Delhi, 2003.
2. Chakravarthy, S.K: Values and ethics for Organizations: Theory and Practice, Oxford University Press, New Delhi, 1999.
3. Satchidananda, M.K: Ethics, Education, Indian Unity and Culture, Ajantha Publications, Delhi, 1991.
4. Das, M.S. & Gupta, V.K.: Social Values among Young adults: A changing Scenario, M.D. Publications, New Delhi, 1995.
5. Bandiste, D.D.: Humanist Values: A Source Book, B.R. Publishing Corporation, Delhi, 1999.
6. Ruhela, S.P.: Human Values and education, Sterling Publications, New Delhi, 1986.
7. Kaul, G.N.: Values and Education in Independent Indian, Associated Publishers, Mumbai, 1975.
8. NCERT, Education in Values, New Delhi, 1992.
9. Swami Budhananda (1983) How to Build Character A Primer: RamakrishnaMission, New Delhi.
10. A Culture Heritage of India (4 Vols.), Bharatiya Vidya Bhuvan, Bombay, (Selected Chapters only)
11. For Life, For the future: Reserves and Remains – UNESCO Publication.
12. Values, A Vedanta Kesari Presentation, Sri Ramakrishna Math, Chennai, 1996.
13. Swami Vivekananda, Youth and Modern India, Ramakrishna Mission, Chennai.
14. Swami Vivekananda, Call to the Youth for Nation Building, Advaita Ashrama, Calcutta.
15. Awakening Indians to India, Chinmayananda Mission, 2003.

SEMESTER-VI

PAPER – XIII INORGANIC CHEMISTRY II

Semester	Subject Title	Subject Code	Total Hours	Credit
VI	**PAPER – XIII INORGANIC CHEMISTRY II**	BCY-DSC10	75	5

LEARNING OBJECTIVES

1. To learn the theories of metallic bonding, types of transistors and structure of alloys.
2. To learn about organometallic compounds, ferrocene and Zeigler Natta catalyst.
3. To get introduced to Nuclear chemistry, theories of nuclear stability and the detection of isotopes.
4. To understand about radioactivity, artificial radioactivity. To learn about radioisotopes and radiocarbon dating.
5. To learn about Clathrates, phosphazenes, zeolites and ultramarines.

LEARNING OUTCOMES

1. The theories of metallic bonding were understood and learnt the types of transistors and structure of alloys. Application of alloys in day-to-day life was taught.
2. The learner studied about the different types of organometallic compounds, structure of ferrocene, properties and uses of Zeigler Natta catalyst. The dominance of Zeigler Natta catalyst in industry was discussed.
3. The concept of Nuclear chemistry was studied, theories of nuclear stability and the methods used for the detection of isotopes was studied in detail. The application of radioisotopes in medical diagnostic procedure was taught in detail.
4. The concept of radioactivity, artificial radioactivity, radioisotopes was studies in detail and concept of radiocarbon dating was studied. The significance of carbon dating in learning about past civilizations and extinct species on Earth was highlighted.
5. To structure and uses of Clathrates, phosphazenes was learnt and composition and uses of zeolites and ultramarines were studied. The learner understood the application of clathrates in desalination process and the use of zeolite in catalysis

UNIT I: METALLIC BONDING (15hrs)

Metallic state – Packing of atoms in metal (BCC , FCC , HCP and simple cube) – Theories of metallic bonding – Electron gas , Pauling and band theories – Semiconductors – n- type and p-

type, transistors – Uses – structures of alloys – substitutional and interstitial solid solutions- Hume Rothery ratio.

UNIT II: CHEMISTRY OF ORGANOMETALLIC COMPOUNDS (15 hrs)

Introduction – Preparation of OrganoMagnesium compounds – Physical and Chemical Properties – Uses, Preparation of OrganoZinc compounds – Physical and Chemical Properties – Uses – Preparation of OrganoLithium compounds – Physical and Chemical properties – Uses – Chemistry of OrganoCopper, OrganoLead, OrganoPhosphorus and OrganoBoron compounds.

Organometallic compounds of alkenes, alkynes and cyclopentadiene

UNIT III: NUCLEAR CHEMISTRY (15 hrs)

Introduction – composition of nucleus – nuclear binding energies –structure of nucleus- nuclear shell model – magic numbers – nuclear stability – theories of nuclear stability - i) nuclear binding energy theory ii) meson theory of nuclear forces iii) nuclear fluid theory – isotopes, isobars, isotones and nuclear isomers – detection of isotopes –Aston's mass spectrograph separation of isotopes – electromagnetic method – the whole number rule and packing fraction – atomic weights.

UNIT IV: RADIOACTIVITY (15 hrs)

Radioactive Emanations, Alpha rays, Beta rays and Gamma rays. The Disintegration theory. Group Displacement Law. Rate of disintegration and Half-life period. Radioactive disintegration series. The Gieger-Nuttal rule -Artifical radioactivity. Induced radioactivity. Nuclear fission-Atom bomb, nuclear fusion-hydrogen bomb. Hazards of radiation. Applications of Radioisotopes.

UNIT V: SOME SPECIAL TYPE OF COMPOUNDS (15 hrs)

Clathrates – examples and structures, interstitial and non-stoichiometric compounds – silicones – composition, manufacture, structure, properties and uses – silanes, phosphazenes – their synthesis, structure and uses – silicates and their polymers – classification into discrete anions – one-, two-, and three-dimensional structures with examples – composition and uses of beryl, asbestos, talc, mica, zeolites and ultramarines.

Types of solvents: Protic and aprotic solvents-aqueous and non- aqueous solvents-liquid ammonia and liquid HF as solvents.

TEXT BOOK

Puri, B.R., Sharma L.R. and Kalia K.C., Principles of Inorganic Chemistry, 30th ed., Milestone publishers and distributers, 2009.

BOOKS FOR REFERENCE

1. Lee J.D., Concise Inorganic Chemistry.5th ed., Blackwell Science,2005.

2. Sharpe Alan G. Inorganic Chemistry. ELBS and Longman,1981.

3. Miessler G. L. and Donald, A. Tarr, Inorganic Chemistry 4th ed., Pearson, 2010.

4. Malik, Wahid U., Tuli G.D. and Madan R.D., Selected Topics in Inorganic Chemistry,7 th ed., S.Chand & Company Ltd., 2007.

5. Gurdeep Raj Chatwal and Harish Mehre, Advanced Inorganic Chemistry, 7th ed., Goel Publishing House, Meerut.

PAPER – XIV – ORGANIC CHEMISTRY II

Semester VI	Subject Title	Subject Code	Total Hours	Credit
	PAPER – XIV – ORGANIC CHEMISTRY II	BCY-DSC11	75	5

LEARNING OBJECTIVES

1. Learning the chemistry of biopolymers – carbohydrates and proteins
2. Understanding Vitamins
3. Learning the chemistry of natural products – alkaloids and terpenoids
4. Learning the mechanism of various types of molecular rearrangements
5. Introduced to the concepts of stereochemistry.

LEARNING OUTCOMES

1. The chemistry of biopolymers – carbohydrates and proteins were studied in detail
2. The structure of Vitamins were understood. The learners were taught about the role of biopolymers in maintaining a healthy life.
3. The chemistry of natural products – alkaloids and terpenoids, their structure elucidation and properties were learnt. The application of alkaloids in cell activity and its role as stimulators was understood.
4. The mechanism of various types of molecular rearrangements were understood and learnt
5. The concepts of stereochemistry, geometrical and optical isomerism, concept of chirality projection formulae and types of geometrical isomerism were discussed in detail. The learner were given an insight into the 3D structure of important organic compounds.

UNIT 1: CHEMISTRY OF CARBOHYDRATES (15 hrs)

Carbohydrates –Definition and Classification of carbohydrates with examples. Monosaccharides: Explanation of enantiomers, diastereomers, epimers and anomers with examples. Mechanism muta rotation, osazone formation. Absolute configurations of glucose and fructose. Structural elucidation of glucose and fructose (includes cyclic and Haworth structure). Inter conversions, ascending and descending the sugar series. Disaccharide – Sucrose, Maltose – Structural elucidation. Polysaccharide – Starch and Cellulose (Elementary treatment).

UNIT 2: CHEMISTRY OF PROTEINS AND VITAMINS (15 hrs)

Amino acids – Classification, General methods of preparation and reactions, zwitter ion, isoelectric point. Peptides and proteins – Peptide linkage, Classification of proteins, primary structure, End group analysis – Sanger’s method and Edman method, secondary structure, tertiary structure, denaturation.

Vitamins – Classification, biological importance of Vitamins,

Structural elucidation of Vitamin C. Structures of Vitamin A and Vitamin D.

UNIT 3: CHEMISTRY OF ALKALOIDS AND TERPENOIDS (15 hrs)

Chemistry of natural products – Alkaloids – Isolation, classification, general methods of elucidating structure. Structural elucidation of nicotine and piperine. Terpenes – classification, isoprene rule, isolation and structural elucidation of citral, α- terpeniol and menthol.

UNIT 4: MOLECULAR REARRANGEMENTS (10 hrs)

Molecular rearrangements – Types of rearrangements, Mechanisms for the following rearrangements: pinacol – pinacolone, benzil – benzilic acid, benzidine, Favorskii, Claisen, Fries, Hofmann, Curtius, Schmidt and Beckmann.

Unit-5: STEREOCHEMISTRY OF ORGANIC COMPOUNDS (20 hrs)

Stereoisomerism - definition, classification into geometric and optical isomerism. Optical isomerism — Optical activity, asymmetric centre(chirality), symmetry elements (σ_n, S_n and i), meaning of (+) or d and (-) orl and D and L notations, concept of enantiomerism and diastereoisomerism; Racemisation – methods of Racemisation (by substitution and tautomerism), Resolution – methods of resolution (by mechanical, seeding and biochemical), Walden inversion. Projection formulae- Fischer, flying wedge, Sawhorse and Newmann projections, notation of optical isomerism: - Cahn-Ingold and Prelog rules, R and S notations for one and two chirality (stereogenic) centres, erythro and threo representations. Geometrical isomerism: cis – trans; syn – anti; E – Z descriptors. [3 D visualization through computers]

TEXT BOOK

Bahl B.S. and Arun Bahl, Advanced Organic Chemstry, 12th ed., Sultan Chand and Co., New Delhi, 1997.

BOOKS FOR REFERENCE

1. Finar I.L., Organic Chemistry, Vol. 1&2, 6th ed., Addison Wesley Longman Ltd., London, 1996.

2. Marrison R.T., Boyd R.N., Organic Chemistry, 4th ed., Allyn & Bacon Ltd., New York, 1976.

4. Pine S.H., Organic Chemistry, 4th ed., McGraw-Hill International Book Company, (1986)

5. Peter Sykes, A Guidebook to Mechanism in Organic Chemistry, 6th ed., Pearson Education, 2003.

6. Kalsi, P.S., Stereochemistry of Organic Compounds: Principles and Applications, New Age International, 2011

7. Sujata V Bhat, Nagasampagi B.A., and Meenakshi Sivakumar, Chemistry of Natural Products, Springer, 2006.

8. Agarwal O.P., Organic Chemistry Reactions & Reagents, 49th ed., Goel Publishing House,

2014.

PAPER - XV PHYSICAL CHEMISTRY

Semester	Subject Title	Subject Code	Total Hours	Credit
VI	**PAPER - XV PHYSICAL CHEMISTRY**	BCY-DSC012	75	5

LEARNING OBJECTIVES

1. Learning the basics of chemical kinetics
2. Understanding the basics of catalysis and adsorption
3. Introduced to the fundamentals of photochemistry
4. Learning the basics of group theory
5. Learning the fundamental of electrochemical cells

LEARNING OUTCOMES

1. Learnt the basics of chemical kinetics including the rate of the reaction, order of reaction and derivation of rate constant
2. The basics of catalysis and adsorption was understood, MM equation, types of adsorption isotherm and their limitation was studied in detail. Learners were made to understand the significance of catalysis in life processes.
3. The fundamentals of photochemistry including photophysical process, Quantum efficiency photochemical reactions were understood
4. The basics of group theory, point groups and construction of multiplication table was learnt. Learner was made to understand that group theory has applications in Physics, Chemistry as well as Computer science.
5. The fundamental of electrochemical cells, calculation of thermodynamic quantities of cell and the significance of electrochemical series was learnt in depth. Learner understood the significance of electrochemical cell in almost all gadgets of day-to-day use.

UNIT I: CHEMICAL KINETICS (20 hrs)

Rate of reaction- Average and instantaneous rates, factors influencing rate of reaction - molecularity of a reaction - rate equation - order of reaction. order and molecularity of simple and complex reactions, Rate laws - Rate constants – derivation of rate constants and characteristics for zero, first order, second and third order (equal initial concentration) – Derivation of time for half change with examples. Methods of determination of order of reactions – Experimental methods of determination of rate constant of a reaction – Volumetry, manometry, and polarimetry.

Effect of temperature on reaction rate – temperature coefficient - concept of activation energy - energy barrier -Arrhenius equation. Theories of reaction rates – Collision theory – derivation of rate constant of bimolecular gaseous reaction – Failure of collision theory. Lindemann's theory of unimolecular reaction. Theory of absolute reaction rates – Derivation of rate constant for a

bimolecular reaction – significance of entropy and free energy of activation. Comparison of collision theory and ARRT.

UNIT II: CATALYSIS AND ADSORPTION (15 hrs)

Catalysis – general characteristics of catalytic reactions, auto catalysis, promoters, negative catalysis, poisoning of a catalyst – theories of homogenous and heterogeneous catalysis – Kinetics of Acid – base and enzyme catalysis. Heterogenous catalysis

Adsorption – Chemical and physical adsorption and their general characteristics- distinction between them Different types of isotherms – Freundlich and Langmuir. Adsorption isotherms and their limitations – BET theory

UNIT III: PHOTOCHEMISTRY (10 hrs)

Laws of photo chemistry – Lambert – Beer, Grotthus – Draper and Stark – Einstein. Quantum efficiency. Photo chemical reactions – rate law – Kinetics of H_2-Cl_2, H_2-Br_2 and H_2-I_2 reactions, comparison between thermal and photochemical reactions.

UNIT IV: GROUP THEORY (10 hrs)

Symmetry elements and symmetry operation symmetry operation of H_2O molecule, Illustration of mathematical rules for the group using symmetry operations of H_2O molecule. Construction of multiplication table, for H_2O molecule. Point group - Definition Elements (symmetry operations) of the following point groups Cn (C_2, C_3), Cnv (C_{2V}, C_{3V}) and C_{nh}(C_{2h}, C_{3h})

UNIT V: ELECTROCHEMICAL CELLS (20 hrs)

Electrolytic & Galvanic cells – Reversible and irreversible cells. Conventional representation of electrochemical cells. Electromotive force of a cell and its measurement computation of E.M.F. calculation of thermodynamic quantities of cell reactions (ΔG, ΔH, ΔS and K_{eq}). Application of Gibbs Helmholtz equation. Calculation of E.M.F. Nernst equation. Types of reversible electrodes – Gas/metal ion-metal/metal ion; metal/insoluble salt/anion and Redox electrodes. Electrode reactions – Nernst equation – Derivation of cell E.M.F. and single electrode potential - standard hydrogen electrode – reference electrodes – standard electrodes potentials – sign convention – Electrochemical series and its significance. Concentration cell with and without transport. Liquid junction potential. Application of EMF concentration cells. Valency of ion, solubility product and activity co-efficient. Potentiometric titrations. Determination of pH using Hydrogen, quinhydrone and glass electrodes. Determination of pKa of acids by potentiometric method. Corrosion - general and electrochemical theory - passivity - prevention of corrosion.

TEXT BOOKS

1. Puri B.R., Sharma L.R. and Pathania M.S., Principles of Physical Chemistry, 47th ed., Vishal Publishing Company, 2016.

2. Sharma K.K. and Sharma L.K., A Textbook of Physical Chemistry, 6th ed., S. Chand, 2016.

BOOKS FOR REFERENCES

1. Maron S.H. and Lando J.B. Fundamentals of Physical Chemistry, Macmillan.

2. Glasstone S. and Lewis. D., Elements of Physical Chemistry, Macmillan

3 Kheterpal S.C. Pradeep Physical Chemistry, Volume I & II, Pradeep Publications Jalandhur, 2004.

4. Jain D.V.S. and Jainhar S.P., Physical Chemistry, Principles and Problems, Tata Mc Graw Hill, New Delhi, 1988.

5. Bajpai D.N., Advanced Physical Chemistry, S. Chand Publishing, 2001.

6. Negi A.S. and Anand S.C., A Textbook of Physical Chemistry, John Wiley & Sons Pvt. Ltd., 1986.

ELECTIVE PAPER- ANALYTICAL CHEMISTRY

Semester	Subject Title	Subject Code	Total Hours	Credit
VI	ANALYTICAL CHEMISTRY	BCY-DSE3A	75	5

Learning Outcomes:

1. Student will be able to evaluate the analytical data in terms of statistics, estimate the types errors in chemical analysis, expresses the terms such as mean, median, precision, accuracy, absolute error and relative error, standard deviation.
2. Student will be able to understand various gravimetric analysis methods, defines the properties of precipitate and precipitating agents. Various chromatographic techniques and applications are understood.
3. Student learns the principles, instrumentation of spectroscopic methods and electroanalytical techniques in detail.

UNIT – I (10 HRS)

Data Analysis – Theory of errors – idea of significant figures and its importance with examples – Precision - accuracy - methods of expressing accuracy -

error analysis – minimizing errors methods of expressing precision – average deviation – standard deviation and confidence limit.

Purification of solid compounds – extraction – use of immiscible solvents - soxhlet extraction Purification of liquids – experimental techniques distillation – fractional distillation – vacuum distillation – steam distillation –tests for purity.

UNIT – II (20 HRS)

Principles of gravimetric analysis – characteristics of precipitating agents – choice of precipitants and conditions of precipitation –specific and selective precipitants – DMG, cupferron, salicylaldehyde, ethylendediamine – use of sequstering agents – co-precipitation – post precipitation – peptisation – differences – reduction of error – precipitation from homogeneous solutions – calculations in gravimetric methods – use of gravimetric factor.

Thermal analytical methods – Principle involved in thermogravimetric analysis and differential gravimetric analysis – discussion of various components with Block diagram –

characteristics of TGA and DTA – factors affecting TGA and DTA, curves – thermometric titrations.

CHROMATOGRAPHY TECHNIQUES – PRINCIPLES - ADSORPTION, PARTITION AND ION EXCHANGE

Chromatography, column chromatography – adsorbents – preparation of column – elution, recovery of substance and applications. TLC – choice of adsorbent and solvent - preparation of chromatogram (Rf value) and applications - Paper chromatography - Solvents used - factors affecting Rf value – separation of amino acid mixtures.

UNIT – III (15 HRS)

Definition of spectrum – electromagnetic radiation – quantisation of different forms of energies of molecules – translational, vibrational, rotational, vibrational and electronic energies.

UV – Visible spectroscopy – absorption laws –theory- electronic spectra – types of electronic transitions – chromophores and auxochromes –absorption bands and intensity – factors governing absortion maxima and intensity – instrumentation

IR spectroscopy – vibrations of diatomic molecules- harmonic and anharmonic oscillators, zero point energy, force constant, condition for a molecule to be IR active, seletion rules – instrumentation.

UNIT – IV (15 HRS)

NMR spectroscopy – principle – equivalent and non-equivalent protons – shielded and de-shielded protons, chemical shift – TMS, delta tau scales, spin-spin coupling- analysis of spectrum of ethanol - instrumentation

MASS SPECTROMETRY:

Basic principles of mass spectrum Instrumentation and Block diagram molecular ion peak, base peak, isotopic peak, fragmentation – Nitrogen rule - determination of molecular formulae – fragmentation and mass spectrum of simple organic compounds – alcohols and carbonyl compounds- McLafferty rearrangement.

UNIT –V (15 HRS)

Polarography – principle – concentration polarization – dropping mercury electrode – advantages and disadvantages – migration and diffusion currents – Ilkovic equation (derivation not required) and significance – experimental assembly –electrodes – capillary – current voltage curve – oxygen wave – influence of temperature and agitation on diffusion layer –

polarography as an analytical tool in quantitative and qualitative analysis . Amperometry – basic principles and uses.

REFERENCES

1. Gopalan R., Rangarajan K., and Subramanian P.S., Elements of Analytical Chemistry, 3rd ed. Reprint, Sultan Chand & Sons, 2013.
2. Skoog D.A., West D.M., James Holler F. and Stanley R., Fundamentals of Analytical Chemistry, 9th ed., 2013Khopkar S.M., Analytical Chemistry, New Age International.

HOD **PRINCIPAL**

SHANTHI RAVICHANDRAN

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