

SACRED HEART COLLEGE (AUTONOMOUS)

DEPARTMENT OF CHEMISTRY

BACHELOR OF SCIENCE IN CHEMISTRY

Course plan

Academic Year 2018-19

Semester Two

	PROGRAMME OUTCOME
PO 1	Critical Thinking: Take informed actions after identifying the assumptions that frame our thinking and actions, checking out the degree to which these assumptions are accurate and valid, and looking at our ideas and decisions (intellectual, organizational, and personal) from different perspectives.
PO 2	Effective Communication: Speak, read, write and listen clearly in person and through electronic media in English and in one Indian language, and make meaning of the word by connecting people, ideas, books, media and technology.
PO 3	Effective Citizenship: Demonstrate empathetic social concern and equity centered national development, and the ability to act an informed awareness of issues and participate in civic life through volunteering.
PO 4	Environment and Sustainability: Understand the issues of environmental contexts and sustainable development.
PO5	Ethics: Recognise different value systems including your own, understand the moral dimensions of your decisions, and accept responsibility for them.
PO 6	Global Perspective: Understand the economic, social and ecological connections that link the world's nations and people.

PROGRAMME SPECIFIC OUTCOMES

PSO 1	Explain the basic concepts and solve the problems related to inorganic, organic theoretical and physical chemistry.
PSO 2	Apply the principles of chemistry in industry, agriculture, medicine and environment.
PSO 3	Experiment, analyze and draw conclusions from qualitative, quantitative and synthetic laboratory exercises in chemistry.
PSO 4	Design projects in different fields of chemistry and develop research aptitude.

COURSE STRUCTURE

Course Code	Title Of The Course	No. Hrs./ Week	Credits	Total Hrs./Sem
15U2CCENG3	CRITICAL THINKING, ACADEMIC WRITING AND PRESENTATION	5	4	90
15U2CCENG4	MUSINGS ON VITAL ISSUES	4	3	72
15U2CCHIN2A	TRANSLATION, COMMUNUCATION SKILLS AND APPLIED GRAMMAR	4	4	72
15U2CCFRN2A	FRENCH LANGUAGE AND COMMUNICATION SKILLS II	4	4	72
15U2CCSAN2A	COMMUNICATION SKILLS IN SANSKRIT LANGUAGE	4	4	72
15U2CCMAL2A	KAVITHA	4	4	72
15U2CRCHE02	THEORETICAL AND INORGANIC CHEMISTRY II	2	2	36
15U2CPPHY2	ELECTRIC AND MAGNETIC PHENOMENA, THERMODYNAMICS AND SOLID STATE PHYSICS	2	2	36
15U2CPMAT02	INTEGRAL CALCULUS AND MATRICES	4	3	60

COURSE PLAN

PROGRAMME	BACHELOR OF SCIENCE IN CHEMISTRY	SEMESTER	2
COURSE CODE AND TITLE	15U2CCENG3: CRITICAL THINKING, ACADEMIC WRITING AND PRESENTATION	CREDIT	4
HOURS/WEEK	5	HOURS/SEM	90
FACULTY NAME	MR. BIJO N MATHEW		

	COURSE OUTCOMES	PO / PSO	CL
CO 1	Comprehends fundamental concepts of critical reasoning and develops the capacity to read and respond critically, drawing conclusions, generalizing, differentiating fact from opinion and creating their own arguments.	PO 1, PSO 1	U
CO 2	Develops appropriate and impressive writing styles for various contexts.	PO 1, PSO 1	U
CO 3	Write and correct structural imperfections and edit what they have written.	PO 1, PO 4, PSO 1	U
CO 4	Develops capacity for making academic presentations effectively and impressively.	PO 1, PSO 3	U

Session s	Topic	Learning Resources	Value Additions	Course Outcome
1	Introduction to Critical Thinking	Lecture	Q & A Session	CO 1
2	Introduction to Critical Thinking	Lecture	Q & A Session	CO 1
3	Reasoning and Arguments	Discussion		CO1
4	Reasoning and Arguments	Discussion		CO1
5	Deductive and Inductive Arguments	Lecture		CO1
6	Deductive and Inductive Arguments	Lecture		CO1
7	Fallacies	Lecture		CO1
8	Fallacies	Lecture		CO1
9	Inferential Comprehension	Reading Exercises		CO1
10	Inferential Comprehension	Reading Exercises		CO1
11	Critical Thinking and Academic	Lecture		CO1

	Writing			
12	Critical Thinking and Academic Writing	Lecture		CO1
13	Critical Thinking and Academic Writing	Exercises		CO1
14	Critical Thinking and Academic Writing	Exercises		CO1
15	Writing Models	Introductory Lecture		CO2
16	Writing Models	Introductory Lecture		CO2
17	Writing Letters	General Principles	Q & A Session	CO2
18	Writing Letters	General Principles	Q & A Session	CO2
19	Writing a Letter to the Editor	Exercise - 1		CO2
20	Writing a Letter to the Editor	Exercise - 1		CO2
21	Letter to the Editor	Discussion on the Samples done		CO2
22	Letter to the Editor	Discussion on the Samples done		CO2
23	Resume	General Guidelines		CO2
24	Resume	General Guidelines		CO2
25	Resume Writing	Writing Exercise		CO2
26	Resume Writing	Writing Exercise		CO2
27	Resume Writing	Discussion on the samples		CO2
28	Resume Writing	Discussion on the samples		CO2
29	Covering Letter	General Introduction and Writing Exercise		CO2
30	Covering Letter	General Introduction and Writing Exercise		CO2
31	Covering Letter	Discussion on the samples	Q & A Session	CO2
32	Covering Letter	Discussion on the samples	Q & A Session	CO2
33	Emails	General Instructions and Writing Exercise		CO2
34	Emails	General Instructions and Writing Exercise		CO2
35	Emails	Discussion on the Samples	Quiz	CO2
36	Emails	Discussion on the Samples	Quiz	CO2

37	Interview Skills	Discussion on the general principles		CO2
38	Interview Skills	Discussion on the general principles		CO2
39	Group Discussion	Practical sessions and Evaluation		CO2
40	Group Discussion	Practical sessions and Evaluation		CO2
41	Accuracy in Academic writing	Lecture		CO3
42	Accuracy in Academic writing	Lecture		CO3
43	Articles and Determiners	Lecture and discussion		CO3
44	Articles and Determiners	Lecture and discussion		CO3
45	Nouns and Pronouns	Lecture		CO3
46	Nouns and Pronouns	Lecture		CO3
47	Subject-verb agreement	Lecture and discussion		CO3
48	Subject-verb agreement	Lecture and discussion		CO3
49	Phrasal verbs	Lecture	Q & A Session	CO3
50	Phrasal verbs	Lecture	Q & A Session	CO3
51	Modals	Lecture		CO3
52	Modals	Lecture		CO3
53	Tenses	Lecture and demonstration		CO3
54	Tenses	Lecture and demonstration		CO3
55	Conditional clauses	General Instructions and Writing Exercise		CO3
56	Conditional clauses	General Instructions and Writing Exercise		CO3
57	Relative Pronouns	Lecture and demonstration	Quiz	CO3
58	Relative Pronouns	Lecture and demonstration	Quiz	CO3
59	Passive Voices	Lecture and illustration		CO3
60	Passive Voices	Lecture and illustration		CO3
61	Conjunctions	Lecture		CO3
62	Conjunctions	Lecture		CO3
63	Embedded questions	Demonstration		CO3
64	Embedded questions	Demonstration		CO3
65	Punctuations and Abbreviations	General Instructions and Writing Exercise		CO3
66	Punctuations and	General Instructions and		CO3

	Abbreviations	Writing Exercise		
67	Soft skills for academic presentations	Presentation and lecture		CO4
68	Soft skills for academic presentations	Presentation and lecture		CO4
69	Effective communication skills	Lecture	Q & A Session	CO4
70	Effective communication skills	Lecture	Q & A Session	CO4
71	How to structure presentation	Lecture and Demonstration		CO4
72	How to structure presentation	Lecture and Demonstration		CO4
73	Flip Charts, OHP, Power point presentation	Demonstration		CO4
74	Flip Charts, OHP, Power point presentation	Demonstration		CO4
75	Clarity and brevity in presentation	Lecture		CO4
76	Clarity and brevity in presentation	Lecture		CO4
77	Interaction and persuasion	Lecture		CO4
78	Interaction and persuasion	Lecture		CO4
79	Interview skills	Face to face interaction, demonstration		CO4
80	Interview skills	Face to face interaction, demonstration		CO4
81	Interview skills	Face to face interaction, demonstration		CO4
82	Group Discussion	Demonstration and Lecture		CO 4
83	Group Discussion	Demonstration and Lecture		CO 4
84	Group Discussion	Demonstration and Lecture		CO 4
85	Group Discussion	Demonstration and Lecture		CO 4
86	Group Discussion	Demonstration and Lecture	Q & A Session	CO 4
87	Group Discussion	Demonstration and Lecture		CO 4
88	Revision	Discussion and revising the topics		CO 4

89	Revision	Discussion and revising the topics		CO 4
90	Revision	Discussion and revising the topics		CO 4

ASSIGNMENT

	Date of completion	Topic of Assignment & Nature of assignment (Individual/Group – Written/Presentation – Graded or Non-graded etc)	Couse Outcome
1	03 – 02 -2019	Draft a Resume for applying for the career you wish to choose	CO 2

REFERENCE

Marilyn Anderson, Pramod K Nayar and Madhucchandra Sen. Critical Thinking, Academic Writing and Presentation Skills. Pearson Education and Mahatma Gandhi University

COURSE PLAN

PROGRAMME	BACHELOR OF SCIENCE IN CHEMISTRY	SEMESTER	2
COURSE CODE AND TITLE	15U2CCENG4 : MUSINGS ON VITAL ISSUES	CREDIT	3
HOURS/WEEK	4	HOURS/SEM	72
FACULTY NAME	Dr. TOM C THOMAS		

	COURSE OUTCOMES	PO / PSO	CL
CO 1	Explore the world of literature further and appreciate the universality of human experience and aspirations.	PO 1, PSO 1	U
CO 2	Comprehend different genres of writings – essays, poetry and short story.	PO 1, PSO 1	U
CO 3	Evaluate literature and develop their ability to read texts critically.	PO 1, PO 4, PSO 1	U
CO 4	Develop a sense of appreciation and proficiency in language.	PO 1, PSO 3	U

Sessio ns	Topic	Learning Resources	Value Additions	Course Outcome
1	Introducing the text book	Group Discussion	Q & A Session	CO1
2	Introducing the text book	Group Discussion	Q & A Session	CO1
3	The dark side of growth	Lecture		CO1
4	The dark side of growth	Lecture		CO1
5	The dark side of growth	Lecture		CO1
6	The dark side of growth	Lecture		CO1
7	The dark side of growth	Lecture		CO1
8	The dark side of growth	Lecture		CO1
9	The dark side of growth	Lecture		CO1
10	The dark side of growth	Lecture		CO1
11	Discussing the questions	Group Presentations	Q & A Session	CO4
12	Discussing the questions	Group Presentations	Q & A Session	CO4
13	Money madness(D.H	Discussion		CO1

	Lawrence)			
14	Money madness(D.H Lawrence)	Discussion		CO1
15	Money madness(D.H Lawrence)	Lecture, Presentation by the students		CO1
16	Money madness(D.H Lawrence)	Lecture, Presentation by the students		CO1
17	For the disposed(S. Joseph)	Lecture, discussion		CO1
18	For the disposed(S. Joseph)	Lecture, discussion		CO1
19	For the disposed(S. Joseph)	Lecture, discussion		CO1
20	For the disposed(S. Joseph)	Lecture, discussion		CO1
21	First Internals			
22	First Internals			
23	The social costs of Economic Globalization	Presentation by the students	Q & A Session	CO2
24	The social costs of Economic Globalization	Presentation by the students	Q & A Session	CO2
25	The social costs of Economic Globalization	Presentation by the students		CO2
26	The social costs of Economic Globalization	Presentation by the students		CO2
27	The social costs of Economic Globalization	Presentation by the students		CO2
28	The social costs of Economic Globalization	Presentation by the students		CO2
29	Distribution of answer sheets	Discussion, correction of common mistakes		CO3
30	Distribution of answer sheets	Discussion, correction of common mistakes		CO3
31	The universal declaration of human	Discussion on the evolution of the declaration of rights-		CO3

	rights	discussion on natural rights and legal rights, concept of rights in various religions.		
32	The universal declaration of human rights	Discussion on the evolution of the declaration of rights-discussion on natural rights and legal rights, concept of rights in various religions.		CO3
33	The universal declaration of human rights	Discussion, answering the questions		CO3
34	The universal declaration of human rights	Discussion, answering the questions		CO3
35	The universal declaration of human rights	Discussion, answering the questions		CO3
36	Human Rights and Legal Responsibilities- Nani A. Palkhivala	Lecture- discussion on the concept of freedom, legal awareness, human rights violations in the society, rights of woman...		CO3
37	Human Rights and Legal Responsibilities- Nani A. Palkhivala	Lecture- discussion on the concept of freedom, legal awareness, human rights violations in the society, rights of woman...		CO3
38	Human Rights and Legal Responsibilities- Nani A. Palkhivala	Lecture- discussion on the concept of freedom, legal awareness, human rights violations in the society, rights of woman...		CO3
39	Human Rights and Legal Responsibilities- Nani A. Palkhivala	Analysis of answers and presentation by the students		CO3
40	Human Rights and Legal Responsibilities- Nani A. Palkhivala	Analysis of answers and presentation by the students		CO3

41	Human Rights and Legal Responsibilities- Nani A. Palkhivala	Analysis of answers and presentation by the students		CO3
42	Twelve Million Black Voices- Richard Wright	Discussion on African-American writing, Slave narratives, emancipation of blacks, Dalit writings.		CO3
43	Twelve Million Black Voices- Richard Wright	Discussion on African-American writing, Slave narratives, emancipation of blacks, Dalit writings.		CO3
44	Twelve Million Black Voices- Richard Wright	Discussion on African-American writing, Slave narratives, emancipation of blacks, Dalit writings.		CO3
45	Twelve Million Black Voices- Richard Wright	Discussion on African-American writing, Slave narratives, emancipation of blacks, Dalit writings..Analysis of answers and presentations by the students		CO2
46	Twelve Million Black Voices- Richard Wright	Discussion on African-American writing, Slave narratives, emancipation of blacks, Dalit writings..Analysis of answers and presentations by the students		CO2
47	Twelve Million Black Voices- Richard Wright	Discussion on African-American writing, Slave narratives, emancipation of blacks, Dalit writings..Analysis of answers and presentations by the students		CO2
48	Lost Forests- Johannes V. Jensen	Lecture on Slave narratives, African- American writing,		CO3

		concept of freedom, bonded labour, child labour, poverty.		
49	Lost Forests- Johannes V. Jensen	Lecture on Slave narratives, African- American writing, concept of freedom, bonded labour, child labour, poverty.		CO3
50	Lost Forests- Johannes V. Jensen	Lecture on Slave narratives, African- American writing, concept of freedom, bonded labour, child labour, poverty.		CO3
51	Lost Forests- Johannes V. Jensen	Presentation of answers by the students		CO4
52	Lost Forests- Johannes V. Jensen	Presentation of answers by the students		CO4
53	Lost Forests- Johannes V. Jensen	Presentation of answers by the students		CO4
54	Why I Want a Wife- Judy Brady	Discussion on marriage, division of job, Sufferings of women, equal status of women, sexual exploitation		CO4
55	Why I Want a Wife- Judy Brady	Discussion on marriage, division of job, Sufferings of women, equal status of women, sexual exploitation		CO4
56	Why I Want a Wife- Judy Brady	Discussion on marriage, division of job, Sufferings of women, equal status of women, sexual exploitation		CO4
57	Why I Want a Wife- Judy Brady	Discussion on marriage, division of job, Sufferings of women, equal status of women, sexual exploitation		CO4
58	Mother's Day- J.B. Priestly	Role play		CO4
58	Mother's Day- J.B. Priestly	Role play		CO4
59	Mother's Day- J.B. Priestly	Role play		CO4

60	Mother's Day- Priestly	J.B.	Role play		CO4
61	Mother's Day- Priestly	J.B.	Role play		CO4
62	Mother's Day- Priestly	J.B.	Role play		CO4
63	Mother's Day- Priestly	J.B.	Role play		CO4
64	Mother's Day- Priestly	J.B.	Role play		CO4
65	Mother's Day- Priestly	J.B.	Role play		CO4
66	REVISION				
67	REVISION				
68	REVISION				
69	REVISION				
70	REVISION				
71	Second examination	Internal			
72	Distribution of Sheets	Answer	Correction of common mistakes		CO4

ASSIGNMENT

	<i>Date of submission/completion</i>	<i>Topic of Assignment & Nature of assignment (Individual/Group – Written/Presentation – Graded or Non-graded etc)</i>	<i>Weightage</i>
1	04 – 02 - 2019	Review of a book, article	5marks

REFERENCE

- Dr P J George Ed. Musings on Vital Issues. Orient Blackswan and Mahatma Gandhi University.

COURSE PLAN

PROGRAMME	ADDITIONAL LANGUAGE – HINDI	SEMESTER	2
COURSE CODE AND TITLE	15U2CCHIN2A- TRANSLATION, COMMUNUCATION SKILLS AND APPLIED GRAMMAR	CREDIT	4
HOURS/WEEK	4	HOURS/SEM	72
FACULTY NAME	DR. MINIPRIYA R AND MR. SYAMLAL M S		

	COURSE OUTCOMES	PO/ PSO	CL
CO 1	Understand Hindi language and communication.	PO 1, PSO 1	U
CO 2	Understand the importance of correspondence in the fields of administration, media and business.	PO 1, PSO 1	U, A
CO 3	Understand translation as a linguistic, communicative and cultural activity.	PO 1, PO 4, PSO 1	U, A
CO 4	Understand the relevant Socio – Cultural issues and develop writing skills through conversation.	PO 1, PSO 3	U, A
CO 5	Understand grammar and analyse the problems and challenges of communication in Hindi.	PO 4	U, A

CL* Cognitive Level

SESSIONS	TOPIC	LEARNING RESOURCES	VALUE ADDITIONS	COURSE OUTCOMES
1	Introductory Session-	Oral/descriptive	Q & A Session	CO 1
2	Exercise oriented Grammar	Description/exercise		CO 5
3	Parts of speech	Description/exercise		CO 5
4	Noun	Description/exercise		CO 5
5	Pronoun	Description/exercise		CO 5
6	Adjectives	Description/exercise		CO 5
7	Verb	Description/exercise		CO 5
8	Verb	Reading/writing		CO 3
9	Verb	Reading /writing	Q & A Session	CO 3
10	Verb	Reference/Library		CO 2
11	Verb	Discussion	Quiz	CO 5
12	Samvad,Shabd Sangrah	Communication		CO 1

13	Sakshatkar	Communication		CO 1
14	Sakshatkar	Communication		CO 1
15	Sakshatkar	Exercise	Q & A Session	CO 2
16	Sakshatkar	Exercise		CO 4
17	Sakshatkar	Exercise		CO 4
18	Sakshatkar	Reference/Library		CO 2
19	Sakshatkar	Presentation		CO 4,CO 2
20	Sakshatkar	Discussion	Quiz	CO 3
21	CIA – I	1 Hr; Descriptive answers only		
22	Conjunctions	Description/exercise		CO 5
23	Case endings	Description/exercise		CO 5
24	Auxiliary verbs	Description/exercise		CO 5
25	Tenses	Description/exercise		CO 5
26	Tenses	Description/exercise	Q & A Session	CO 5
27	Tenses	Reading/writing		CO 4
28	Tenses	Reading/writing		CO 4
29	Tenses	Reference/Library		CO 5
30	Tenses	Discussion		CO 5
31	Samvad,Shabd Sangrah	Communication		CO 1
32	Sakshatkar	Communication		CO 3
33	Sakshatkar	Communication	Q & A Session	CO 1
34	Sakshatkar	Communication		CO 1
35	Sakshatkar	Communication		CO 3
36	Sakshatkar	Exercise		CO 4
37	Sakshatkar	Exercise		CO 4
38	Sakshatkar	Exercise		CO 4
39	Sakshatkar	Exercise		CO 4
40	Sakshatkar	Exercise	Quiz	CO 1
41	Translation Introduction	Oral/descriptive		CO 3
42	Theory	Oral/descriptive		CO 3
43	Practice English to Hindi	Exercise		CO 3, CO 4
44	Practice English to Hindi	Exercise		CO 3, CO 4
45	Practice English to Hindi	Exercise	Q & A Session	CO 3
46	Practice English to Hindi	Exercise		CO 4
47	Practice English to Hindi	Exercise		CO 3,CO 4

48	Practice Hindi to English	Exercise		CO 3
49	Practice Hindi to English	Exercise	Q & A Session	CO 3
50	Practice Hindi to English	Exercise		CO 4
51	Practice Hindi to English	Exercise		CO 3,CO 4
52	Practice Hindi to English	Exercise	Quiz	CO 3,CO 4
53	SEMINAR	Paper presentation		CO 1
54	SEMINAR	Paper presentation		CO 2
55	SEMINAR	Paper presentation		CO 3
56	SEMINAR	Paper presentation		CO 4
57	SEMINAR	Paper presentation		CO 5
58	SEMINAR	Paper presentation		CO 3
59	REVISION			
60	REVISION			
61	REVISION			
62	CIA II	2 HOURS		
63	Discussion on the CIA	Group Discussion		CO 1
64	Discussion on the CIA	Group Discussion		CO 3
65	Discussion on the CIA	Group Discussion		CO 2
66	Discussion on the CIA	Debates		CO 1
67	Discussion on the CIA			
68	REVISION			
69	REVISION			
70	REVISION			
71	REVISION			
72	Evaluation of the Course			

ASSIGNMENTS

	Date of submission / completion	Topic of Assignment & Nature of assignment (Individual/Group – Written/Presentation – Graded or Non-graded etc)	Course Outcomes
1	Assignment (December)	Sakshatkar based on the text book and reference – Writing-Individual	CO 1
2	Seminar (January-February)	Paper Presentation based on the text book and reference – Oral-Individual	CO 5

REFERENCES

1. Bhasha Vigyan Evam Hindi Bhasha, Dr.Pandit Banne, Jawahar Pustakalaya, Uttarpradesh.
2. Bhasha Vigyan Evam Hindi Bhasha, Dr.Lakshmikanth Pandey, Jawahar Pustakalaya, Uttarpradesh.

COURSE PLAN

PROGRAMME	BACHELOR OF SCIENCE IN CHEMISTRY	SEMESTER	II
COURSE CODE AND TITLE	15U2CCFRN2A: FRENCH LANGUAGE AND COMMUNICATION SKILLS II	CREDIT	4
HOURS/WEEK	4	HOURS/SEM	72
FACULTY NAME	Dr. SHOBA LIZA JOHN		

	COURSE OUTCOMES	PO / PSO	CL
CO1	Understand the basic concepts of French language including grammar, vocabulary and sentence structure.	PO 1, PO 5 PSO 1	R
CO2	Understand the basic communication skills necessary for living in France and French speaking countries.	PO 1 PSO 1	U
CO3	Describe oneself and ones surroundings using a repertory of words and expressions in a simple and structured grammatical manner.	PO 1 PSO 1	U
CO4	Develop business communication skills	PO 1, PO 6 PSO 1	U
CO5	Express an issue of concern including topics like environmental, social or health issues, enumerate its causes and consequences and suggest solutions	PO 1, PO 6 PSO 1	U
CO6	Understand the mannerisms, culture and tradition of France and Francophone countries and compare it to one's own country and develop co-cultural feeling	PO 1, PO 6 PSO 1	U
CO7	Understand and appreciate the history of France and Francophone countries and compare it to one's own country	PO 1, PO 6 PSO 1	U
CO8	Understand the special features of France including gastronomy, social institutions, policies, the present French scenario and compare it to one's own country	PO 1, PO 6 PSO 1	U

Sessions	Topic	Learning Resources	Value Additions	COs
1	Introductory Session	Role play, games.	French basic	CO 1, CO 2, CO 3
2	Introductory Session	Role play, games.	French basic	CO 1, CO 2, CO 3
3	Introductory Session	Role play, games.	French basic	CO 1, CO 2, CO 3
4	Pronominal verbs	Chalk n talk	Introducing	CO 1, CO 2,

			oneself	CO 3
5	Pronominal verbs	Chalk n talk	Introducing oneself	CO 1, CO 2, CO 3
6	Pronominal verbs	Chalk n talk	Introducing oneself	CO 1, CO 2, CO 3
7	Pronominal verbs	Games, music		CO 1, CO 2, CO 3
8	Pronominal verbs	Games, music		CO 1, CO 2, CO 3
9	Pronominal verbs	Games, music		CO 1, CO 2, CO 3
10	Me too- me neither	Role play		CO 1, CO 2, CO 3
11	Me too- me neither	Role play		CO 1, CO 2, CO 3
12	Me too- me neither	Role play		CO 1, CO 2, CO 3
13	Developing communicative skills	Chalk n talk		CO 1, CO 2, CO 3
14	Developing communicative skills	Chalk n talk		CO 1, CO 2, CO 3
15	Developing communicative skills	Chalk n talk		CO 1, CO 2, CO 3
16	Narrating one's day	Discussion, ICT		CO 6, CO 7, CO 8
17	Narrating one's day	Discussion, ICT		CO 6, CO 7, CO 8
18	Narrating one's day	Discussion, ICT		CO 6, CO 7, CO 8
19	Adjective interrogative	Game		CO 2, CO 3
20	Civilisation	Chalk n talk, game		CO 2, CO 3
21	Civilisation	Chalk n talk, game		CO 2, CO 3
22	Civilisation	Chalk n talk, game		CO 2, CO 3
23	Civilisation	Role play, listening		CO 2, CO 3
24	Civilisation	Role play, listening		CO 2, CO 3
25	Civilisation	Role play, listening		CO 2, CO 3
26	Vocabulary building exercises	Chalk n talk		CO 2, CO 3
27	Vocabulary building exercises	Chalk n talk		CO 2, CO 3

28	Vocabulary building exercises	Chalk n talk		CO 2, CO 3
29	Buying A Product	Role play		CO 5, CO 6, CO 7, CO 8
30	Buying A Product	Role play		CO 5, CO 6, CO 7, CO 8
31	Buying A Product	Role play		CO 5, CO 6, CO 7, CO 8
32	Products From Generation To Generation	Discussion, ICT		CO 5, CO 6, CO 7, CO 8
33	Products From Generation To Generation	Discussion, ICT		CO 5, CO 6, CO 7, CO 8
34	Products From Generation To Generation	Discussion, ICT		CO 5, CO 6, CO 7, CO 8
35	Food vocabulary	Oral, description		CO 2, CO 3
36	Food vocabulary	Oral, description		CO 2, CO 3
37	Food vocabulary	Oral, description		CO 2, CO 3
38	Articles partitifs	Games, music		CO 2, CO 3
39	Articles partitifs	Games, music		CO 2, CO 3
40	Articles partitifs	Games, music		CO 2, CO 3
41	Future proche	Role play		CO 2, CO 3
42	Future proche	Role play		CO 2, CO 3
43	Future proche	Role play		CO 2, CO 3
44	Giving an order and taking order at a restaurant	Chalk n talk/roleplay		CO 2, CO 3
45	Giving an order and taking order at a restaurant	Chalk n talk/roleplay		CO 2, CO 3
46	Giving an order and taking order at a restaurant	Chalk n talk/roleplay		CO 2, CO 3
47	Civilisation	Role play/presentation		CO 2, CO 3
48	Civilisation	Discussion		CO 5, CO 6, CO 7, CO 8
49	Civilisation	Discussion		CO 5, CO 6, CO 7, CO 8
50	Civilisation	Discussion		CO 5, CO 6, CO 7, CO 8
51	Past tense	Chalk n talk/Role plays		CO 2, CO 3

52	Past tense	Chalk n talk/Role plays		CO 2, CO 3
53	Past tense	Chalk n talk/Role plays		CO 2, CO 3
54	Describing a past event	Chalk n talk		CO 1, CO 2, CO 3
55	Describing a past event	Chalk n talk		CO 1, CO 2, CO 3
56	Describing a past event	Chalk n talk		CO 1, CO 2, CO 3
57	Part time jobs vocabulary, ads	Speaking/role play		CO 1, CO 2, CO 3
58	Part time jobs vocabulary, ads	Speaking/role play		CO 1, CO 2, CO 3
59	Part time jobs vocabulary, ads	Speaking/role play		CO 1, CO 2, CO 3
60	Part time jobs vocabulary, ads	Speaking/role play		CO 5, CO 6, CO 7, CO 8
61	Part time jobs vocabulary, ads	Speaking/role play		CO 5, CO 6, CO 7, CO 8
62	Part time jobs vocabulary, ads	Speaking/role play		CO 5, CO 6, CO 7, CO 8
63	Part time jobs vocabulary, ads	Speaking/role play		CO 5, CO 6,
64	Part time jobs vocabulary, ads	Speaking/role play		CO 5, CO 6,
65	Part time jobs vocabulary, ads	Speaking/role play		CO 5, CO 6,
66	Part time jobs vocabulary, ads	Speaking/role play		CO 7, CO 8
67	Part time jobs vocabulary, ads	Speaking/role play		CO 7, CO 8
68	Part time jobs vocabulary, ads	Speaking/role play		CO 7, CO 8
69	Civilization	Discussion/comprehension		CO 6
70	Civilization	Discussion/comprehension		CO 6
71	Civilization	Discussion/comprehension		CO 6
72	Civilisation	Discussion		CO 6

ASSIGNMENTS

	Date of submission / completion	Topic of Assignment & Nature of assignment (Individual/Group – Written/Presentation – Graded or Non-graded etc)	Course Outcomes
1	Assignment (December)	Products From Generation To Generation	CO 5, CO 6, CO 7, CO 8
2	Seminar (January-February)	Civilization	CO 6

COURSE PLAN

PROGRAMME	BACHELOR OF SCIENCE IN CHEMISTRY	SEMESTER	II
COURSE CODE AND TITLE	15U2CCSAN2A: COMMUNICATION SKILLS IN SANSKRIT LANGUAGE	CREDIT	4
HOURS/WEEK	4	HOURS/SEM	72
FACULTY NAME	DR. VIJAYARAJAN K U		

	COURSE OUTCOMES	PO / PSO	CL
CO1	Developing the basic knowledge in Sanskrit	PO 1, PO 5 PSO 1	R
CO2	Students can understand the poetic style with special reference to classical literature	PO 1 PSO 1	U
CO3	Students get an awareness about Indian classical poetic tradition	PO 1 PSO 1	U
CO4	Students familiarize the figures of speech and their usage	PO 1, PO 6 PSO 1	U
CO5	Students develop the communication skills in Sanskrit	PO 1, PO 6 PSO 1	U
CO6	Understand moral values through Drama	PO 1, PO 6 PSO 1	U
CO7	Students develop writing skills in Sanskrit	PO 1, PO 6 PSO 1	U
CO8	Students get awareness about Verbal forms	PO 1, PO 6 PSO 1	U

Sessions	Topic	Learning Resources	Value Additions	COs
1 - 2	Introductory session- ViBhakthi	Lecturing	Q & A Session	CO 1, CO 2, CO 8
3 - 4	Seven forms of ViBhakthi	Lecturing		CO 1, CO 2, CO 5, CO 8
5 - 6	Forms of rama ,Hari shabdas	Chalk n talk		CO 1, CO 2, CO 4, CO 8
7 - 8	Forms of rema, Guru, Latha Shabdas	Discussion		CO 2, CO 3, CO 4
9 - 10	Verbs- Present Tense	Lecturing		CO 2, CO 3, CO 4
11 - 12	Verbs- Past Tense	Discussion	Q & A Session	CO 2, CO 3, CO 4

13 – 14	Verbs - Future Tense	Discussion		CO 1, CO 2, CO 8
15 - 16	Conversation in Sanskrit	Practicing		CO 1, CO 3, CO 4
17 - 18	Structure of Sentence	Lecturing		CO 2, CO 3, CO 4
19 – 20	Prathama Purusha	Lecturing		CO 2, CO 3, CO 4
21 - 22	Madhyamapurusha	Lecturing		CO 2, CO 3, CO 4
23 - 24	Uthamapurusha	Chalk n talk		CO 3, CO 5
25 - 27	Verb's rule	Discussion		CO 3, CO 4
28 - 30	Use of ekavachana, divivachana, bahuvachana	Role play		CO 4, CO 5, CO 8
31 - 33	Sentence - Active voice	Oral, Description		CO 2, CO 4, CO 6
34 - 36	Sentence - Passive voice	Lecturing	Q & A Session	CO 2, CO 3
37 - 39	Introductory session	Lecturing		CO 7, CO 8
40 - 42	Explaining Ghandakavya	Discussion		CO 7, CO 8
43 - 45	Yaksha's story	Chalk n talk		CO 7, CO 8
46 - 48	Requesting to Megha	Discussion		CO 4, CO 5, CO 8
49 - 51	Reading slokas	Discussion		CO 3, CO 4, CO 5
52 - 54	Yaksha's explanation	Lecturing		CO 4, CO 5, CO 8
55 - 57	Introductory session	Lecturing		CO 3, CO 4, CO 8
58 - 60	Bhasa's Dramas	Lecturing		CO 4, CO 5, CO 8
61 - 63	Prathamanga	Lecturing	Q & A Session	CO 1, CO 2, CO 3
64 - 66	Dvitheeyanga	Oral, Description		CO 1, CO 2, CO 3
67 - 68	Tritheeyanga	Lecturing		CO 1, CO 2, CO 3
69	Summarizing	Lecturing		CO 4, CO 5, CO 6
70	Revision			
71	Revision			
72	Revision			

ASSIGNMENTS

	Date of submission / completion	Topic of Assignment & Nature of assignment (Individual/Group – Written/Presentation – Graded or Non-graded etc)	Course Outcomes
1	Assignment (December)	Forms of rema, Guru, Latha Shabdhas	CO 2, CO 3, CO 4
2	Seminar (January-February)	Explaining Ghandakavya	CO 7, CO 8

COURSE PLAN

PROGRAMME	BACHELOR OF SCIENCE IN CHEMISTRY	SEMESTER	2
COURSE CODE AND TITLE	15U2CCMAL2A: കവിത	CREDIT	4
HOURS/WEEK	4	HOURS/SEM	72
FACULTY NAME	FR. XAVIER C S AND MR. VISHNURAJ P		

	COURSE OUTCOMES	PO / PSO	CL
CO 1	സാമാന്യമായ സാഹിത്യപരിചയവും വായനാഭിരുചിയും കാഴ്ചപ്പാടുകളും സൃഷ്ടിക്കുക	PO 1, PSO 1	U
CO 2	വ്യാവഹാരികതലത്തിൽ മാതൃഭാഷ ഉപയോഗിക്കുന്നതിനുള്ള കഴിവ് വളർത്തിയെടുക്കുക	PO 1, PSO 1	U
CO 3	വിവിധ ഘട്ടങ്ങളിലായി രചിക്കപ്പെട്ടിട്ടുള്ള നല്ല കവിത പരിചയപ്പെടുക	PO 1, PO 4, PSO 1	U
CO 4	ഭാഷാപ്രയോഗവും, ആശയവിനിമയവും മാതൃഭാഷയിൽ സുഗമമായി ചെയ്യാൻ കഴിയുക	PO 1, PSO 3	U

CL* Cognitive Level

Sessions	Topic	Learning Resources	Value Additions	Course Outcomes
1	Introductory Session	Lecturing	Q & A Session	CO 1, CO 2, CO 3
2	കാവ്യസാഹിത്യത്തെ പരിചയപ്പെടുത്തുന്നു	Lecturing		CO 2, CO 3
3	മലയാളകവിതയെക്കുറിച്ചുള്ള കുട്ടികളുടെ അറിവുകൾ പരിശോധിക്കുന്നു	Group Discussion		CO 1, CO 2, CO 3
4	ചിന്താഗണിപ്പുന്ന കവിത വായിക്കാൻ ആവശ്യപ്പെടുന്നു.	Independent Reading/Lecturing		CO 1, CO 2, CO 4

5	കവിതാവിശകലനം	Lecturing		CO 2, CO 3
6	കവിതാവിശകലനം	Lecturing	Q & A Session	CO 1, CO 2, CO 3
7	ചിന്താഗ്നി എന്ന കവിത- ശൃംഗ് തിരിച്ചുചർച്ച നടത്തുന്നു {സ്ത്രീപക്ഷസമീപന ത്തിൽ}	writing/Lecturing/Group Discussion		CO 2, CO 3
8	സൂര്യകാന്തി എന്ന കവിത വായിച്ചുശൃംഗ് തിരിച്ചുആശയം അവതരിപ്പിക്കുന്നു.	Group Discussion/p oint presentation/evaluation		CO 1, CO 2, CO 3
9	കവിതാവിശകലനം	Reading/Lecturing		CO 1, CO 2, CO 4
10	കവിതാവിശകലനം	Reading/Lecturing	Q & A Session	
11	മനസ്സിനി എന്ന കവിതയുടെ ആമുഖം പറയുന്നു	Lecturing		CO 1, CO 2, CO 3
12	ആസ്വാദന കുറിപ്പ് തയ്യാറാക്കുന്നു	writing/discussion/Lecturing		CO 2, CO 3
13	കവിതാവിശകലനം	Reading/Lecturing		CO 1, CO 2, CO 4
14	കവിതാവിശകലനം	Reading/Lecturing	Q & A Session	CO 2, CO 3
15	മോഹൻദാസ് നായർ നാമുറാംഗോഡ് സെയും- കവിത അവതരിപ്പിക്കുന്നു	Lecturing		CO 2, CO 3
16	കവിതാവായന, കവിതാവിശകലനം	Reading		CO 1, CO 2, CO 3
17	വിജയലക്ഷ്മിയുടെ കവിതകളുടെ പരിചയപ്പെടുത്തുന്നു	Reading/Lecturing		CO 2, CO 3
18	കൗസല്യ എന്ന കവിത വിശകലനം ചെയ്യുന്നു	Reading/Lecturing		CO 2, CO 3
19	യുഗളപ്രസാദൻ എന്ന കവിതയുടെ ആമുഖം	Lecturing		CO 1, CO 2, CO

	വതരിപ്പിക്കുന്നു			3
20	കവിതാവായന	Reading	Q & A Session	CO 1, CO 2, CO 3
21	കവിതാവിശകലനം	Reading/Lecturing		CO 1, CO 2, CO 4
22	കവിതാവിശകലനം	Reading/Lecturing		CO 1, CO 2, CO 4
23	പഠിച്ചുകവിതയുടെപൊതുവിശകലനം	Class Discussion		CO 1, CO 2, CO 3
24	CIA -I	1hr; descriptive answers only		CO 2, CO 3
25	SEMINAR PRESENTATION POEMS	Presentation/discussion		CO 2, CO 3
26	SEMINAR PRESENTATION POEMS	Presentation/discussion		CO 1, CO 2, CO 3
27	Discussion on the CIA I	Class Discussion		
28	സാംസ്കാരികതലങ്ങളിൽ കവിതയെങ്ങനെ ഉപയോഗിക്കുന്നു എന്ന വിഷയം ചർച്ച ചെയ്യുന്നു	Discussion		CO 1, CO 2, CO 3
29	സാമൂഹിക, രാഷ്ട്രീയ, സാംസ്കാരികതലങ്ങളിൽ കവിതയെങ്ങനെ ഉപയോഗിക്കുന്നു എന്ന വിഷയം ചർച്ച ചെയ്യുന്നു	Debate/discussion		CO 2, CO 3
30	കുരീപ്പുഴ ശ്രീകുമാറിന്റെ കവിതകളെപ്പറ്റി പറയുന്നു	Class Discussion		CO 2, CO 3
31	തേശ് കുടം എന്ന കവിത പഠിപ്പിക്കുന്നു	Lecturing		CO 1, CO 2, CO 3
32	ഗോപികാദണ്ഡകം - കവിതപാരായണം ചർച്ച	Lecturing/Class Discussion		CO 1, CO 2, CO 4
33	കവിതാവിശകലനം	Reading/Lecturing		CO 1, CO 2, CO 4

				4
34	സമൂഹം,സ്ത്രീ,പ്രകൃതി എന്ന വിഷയംപഠിക്കാനുള്ള കവിതകളെമുൻനിർത്തികൂട്ടികൾചർച്ച നടത്തുന്നു	Reading/Lecturing		CO 1, CO 2, CO 3
35	ഉത്തരാധുനിക കവിതകളുടെ സവിശേഷതകൾ പറയുന്നു	Lecturing		CO 2, CO 3
36	പുതിയ മലയാള കവിതകൾ ക്ലാസ്സിൽ അവതരിപ്പിക്കുകയും ,അതിനെക്കുറിച്ച് സംവാദങ്ങൾ നടത്തുകയും ചെയ്യുന്നു	Class Discussion		CO 1, CO 2, CO 3
37	മാമ്പഴപ്പാത എന്ന കവിത പരിചയപ്പെടുത്തുന്നു.	Lecturing/Class Discussion		CO 1, CO 2, CO 4
38	മോഹനകൃഷ്ണൻ കാലടി എന്ന കവിയെ പരിചയപ്പെടുത്തുന്നു	Lecturing		CO 2, CO 3
39	നഗരവും ഗ്രാമവും തമ്മിലുള്ള വ്യത്യാസങ്ങളെക്കുറിച്ച് ചർച്ച ചെയ്യുന്നു	Class Discussion		CO 2, CO 3
40	സച്ചിദാനന്ദൻ എന്ന കവിയുടെ മലയാള സാഹിത്യത്തിലെ പ്രാധാന്യത്തെക്കുറിച്ച് പറയുന്നു.	Lecturing Discussion/	Q & A Session	CO 1, CO 2, CO 3
41	മനുഷ്യനും പ്രകൃതിയും എന്ന വിഷയം നാടകമായി അവതരിപ്പിക്കാൻ പറയുന്നു	Drama Performance		CO 2, CO 3
42	ആത്മഹത്യ ചെയ്ത കർഷകൻ	Lecturing		CO 1, CO 2, CO

	വെള്ളത്തെക്കുറിച്ചു സംസാരിക്കുന്നു- എന്ന കവിതയുടെ വിശകലനം			3
43	കടമ്മനിട്ട രാമകൃഷ്ണൻ എന്ന കവിയുടെ മലയാള സാഹിത്യത്തിലെ പ്രാധാന്യത്തെക്കുറിച്ച് പറയുന്നു.	Lecturing Discussion		CO 1, CO 2, CO 3
44	കുറത്തി കവിതയുടെ വിശകലനം	Lecturing		CO 1, CO 2, CO 3
45	കുറത്തി കവിതയുടെ വിശകലനം	Lecturing		CO 1, CO 2, CO 4
46	എസ് .ജോസഫിന്റെ കീരി പലശൃംഗങ്ങളായി തിരിഞ്ഞു വായിച്ച് ആശയം അവതരിപ്പിക്കുന്നു	Discussion/		CO 1, CO 2, CO 3
47	കവിതാവിശകലനം	Lecturing		CO 1, CO 2, CO 4
48	കെ.ജി.ശങ്കരപ്പിള്ളയുടെ നാനാലാതത്ത്വം എന്ന കവിത ചൊല്ലുന്നു	Reading		CO 1, CO 2, CO 4
49	കവിതാവിശകലനം	Lecturing		CO 1, CO 2, CO 3
50	ഒറ്റപ്പെട്ടലിന്റെ അനുഭവങ്ങൾ ചർച്ച ചെയ്യുന്നു റോസ്മേരിയുടെ യശോധരയെന്നവൾ പഠിപ്പിക്കുന്നു	Lecturing		CO 1, CO 2, CO 4
51	കവിതാവിശകലനം	Lecturing		CO 2, CO 3
52	വീരാൻകുട്ടിയുടെ പറക്കം എന്ന കവിത പഠിപ്പിക്കുന്നു	Lecturing Discussion/		CO 1, CO 2, CO 3
53	പറക്കം എന്ന കവിത വിശകലനം ചെയ്യുന്നു	Lecturing		CO 2, CO 3

54	പവിത്രൻ തീക്കുന്നിയുടെ ഇനി എന്ന കവിത പഠിപ്പിക്കുന്നു	Lecturing		CO 2, CO 3
55	ഇനി എന്ന കവിത കവിതാവിശകലനം	Lecturing		CO 2, CO 3
56	നാടൻപാട്ടിനെക്കുറിച്ചു ചർച്ച	Discussion		CO 2, CO 3
57	മറിയാമ്മ ചേട്ടത്തിയുടെ പാട്ട് പഠിപ്പിക്കുന്നു	Lecturing Discussion		CO 2, CO 3
58	നാടൻപാട്ടിനെക്കുറിച്ചു ചർച്ച	Discussion		CO 2, CO 3
59	ജലസേചനംകവിതസാ മാന്യമായിപരിചയപ്പെ ടുത്തുന്നു	Lecturing		CO 2, CO 3
60	ജലസേചനം- കവിതാവിശകലനം	Reading/Lect uring	Q & A Session	CO 2, CO 3
61	ജലസേചനം- കവിതാവിശകലനം	Reading/Lect uring		CO 2, CO 3
62	ജലസേചനം- കവിതാവിശകലനം	Reading/Lect uring		CO 2, CO 3
63	കവിതാവിശകലനം	Reading/Lect uring		CO 2, CO 3
64	കവിതസമൂഹവുമായി എങ്ങനെഇടപെടുന്നു എന്നവിഷയംചർച്ചചെ യ്ക്കുന്നു	Debate/discu ssion		CO 1, CO 2, CO 4
65	കാല്പനിക,ആധുനിക,ഉ ത്തരാധുനികമലയാള കവിത പൊതുചർച്ച,സംവാദം	Discussion/D ebate		CO 1, CO 2, CO 4
66	CIA II{common}	2hr		
67	CIA II{common}	2hr		
68	CIA II{common}	2hr		
69	CIA II{common}	2hr		
70	CIA II{common}	2hr		
71	CIA II{common}	2hr		
72	SEMINAR PRESENTATION ON POEMS	Presentation/ discussion		CO 1, CO 2, CO 4

ASSIGNMENTS

	Date of submission/completion	Topic of Assignment & Nature of assignment (Individual/Group – Written/Presentation – Graded or Non-graded etc)	Course Outcomes
1	03 – 02 - 2019	പഠിക്കാനുള്ള കവികളുടെ സിലബസിൽ ഉൾപ്പെടാത്ത കവിതകൾ കണ്ടെത്തി വിശകലനം ചെയ്യുക	CO 1, CO 2, CO 3, CO 4
2	01 – 03 – 2019	സമകാലീക കവിതകളുടെ രചനാസവിഷേതകൾ എഴുതുക	CO 1, CO 2, CO 3, CO 4

REFERENCE

- 01.കാവ്യാകാശം-എം .ജി . യൂണിവേഴ്സിറ്റിപ്രസിദ്ധീകരണം
- 02.കവിതാസാഹിത്യചരിത്രം -ഡോ .എം .ലീലാവതി
- 03.മലയാളകവിതാപഠനങ്ങൾ-സച്ചിദാനന്ദൻ

COURSE PLAN

PROGRAMME	BACHELOR OF SCIENCE IN CHEMISTRY	SEMESTER	2
COURSE CODE AND TITLE	15U2CRCHE02: THEORETICAL AND INORGANIC CHEMISTRY II	CREDIT	2
HOURS/WEEK	2	HOURS/SEM	36
FACULTY NAME	MR. SENJU DEVASSYKUTTY (SD) AND DR. JORPHIN JOSEPH (JRJ)		

	COURSE OUTCOMES	PO / PSO	CL
CO 1	Ability to understand the basics of periodicity in the properties of the elements, chemical bonding, nuclear chemistry and different analytical techniques	PO 1, PSO 1	U
CO 2	Ability to apply valence bond and molecular orbital theories to explain the bonding characteristics of different chemical systems.	PO 1, PSO 1	U
CO 3	Ability to interpret the properties such as dipole moment, bond length, magnetic behaviour and bond energy of molecular systems in the light of VB or MO theory.	PO 1, PO 4, PSO 1	U
CO 4	Ability to explore and reflect about the wide range of possibilities and applications of nuclear reactions and radio activity.	PO 1, PSO 3	U
CO 5	Ability to apply gravimetric analysis and different separation/purification techniques effectively in laboratory scale.	PO 4	U

CL* Cognitive Level

SESSION	TOPIC	LEARNING RESOURCES	VALUE ADDITIONS	COURSE OUTCOME
Module 1 - Elements and Periodic Properties (4h) (JRJ)				
1	Modern periodic law – Long form periodic table. Periodicity in properties: Atomic and ionic radii	Conventional Teaching	video	CO 1
2	Ionization enthalpy - Electron affinity (electron gain enthalpy) – Electronegativity. Electronegativity scales: Pauling and Mullikan scales	Conventional Teaching		CO 1
3	Effective nuclear charge – Slater rule and its	Conventional Teaching		CO 1

	applications			
4	Revision-Periodicity in properties and its consequences		quiz	CO 1
Module 2 - Chemical Bonding – I (9h) (JRJ)				
5	Introduction – Type of bonds – Octet rule and its limitations.	Conventional Teaching		CO 2
6	<i>Ionic Bond</i> : Factors favoring the formation of ionic bonds - Lattice energy of ionic compounds - Born-Lande equation (derivation not expected) Solvation enthalpy and solubility of ionic compounds	Conventional Teaching		CO 2
7	Born-Haber cycle and its applications –Properties of ionic compounds - Polarisation of ions – Fajan'srules and its applications.	Conventional Teaching		CO 2
8	<i>Covalent Bond</i> : Lewis theory. Valence Bond Theory. Co ordinate bond	Conventional Teaching		CO 2
9	Hybridization: Definition and characteristics VSEPR theory: Postulates	Conventional Teaching		CO 2
10	Applications – Shapes of molecules- sp (BeCl ₂ , C ₂ H ₂), sp ² (BF ₃ , C ₂ H ₄), sp ³ (CH ₄ , CCl ₄ , NH ₃ ,H ₂ O, NH ₄ ⁺ , H ₃ O ⁺ and SO ₄ ²⁻)	Conventional Teaching	quiz	CO 2
11	sp ³ d (PCl ₅), sp ³ d ² (SF ₆) and sp ³ d ³ (IF ₇) and SF ₄ , ClF ₃ , XeF ₂ , IF ₅ , XeF ₄ , IF ₇ and XeF ₆	Conventional Teaching	quiz	CO 2
12	Limitations of VBT. Properties of covalent compounds. Polarity of covalent bond – Percentage of ionic character –Dipole moment and molecular structure.	Conventional Teaching		CO 2
13	Problems		quiz	
Module 3 - Chemical Bonding – II (9h) (SD)				
14	MO Theory <ul style="list-style-type: none"> ➤ Linear combination of atomic orbitals ➤ Formation of molecular orbitals ➤ Bonding and antibonding molecular orbitals ➤ Stability of molecules based on bond order ➤ Relation between bond order and bond length 	Conventional Teaching		CO 3
15	MO diagram of homo nuclear system <ul style="list-style-type: none"> ➤ H₂, He₂, Li₂, Be₂, B₂, C₂, N₂, O₂, F₂ ➤ Magnetic behaviour of these homo 	Conventional Teaching	quiz	CO 3

	nuclear systems			
16	MO diagram of heteronuclear system <ul style="list-style-type: none"> ➤ CO and NO ➤ Magnetic behaviour of these homo nuclear systems ➤ Comparison of bond length, magnetic behaviour and bond energy of O_2, O_2^+, O_2^{2+}, O_2^- and O_2^{2-} 	Conventional Teaching		CO 3
17	Resonance structures of <ul style="list-style-type: none"> ➤ borate, carbonate and nitrate ions ➤ Comparison of bond energy. 	Conventional Teaching ASSIGNMENT I		CO 3
18	Comparison of VB and MO theories.	Conventional Teaching		CO 3
19	Metallic Bond <ul style="list-style-type: none"> ➤ Free electron theory ➤ valence bond theory 	Conventional Teaching ICT		CO 3
20	Band theory Explanation of metallic properties based on these theories.	Conventional Teaching	Q & A session	CO 3
21	Intermolecular Forces <ul style="list-style-type: none"> ➤ Induction forces and dispersion forces 	Conventional Teaching		CO 3
22	Hydrogen bond Intra and inter molecular hydrogen bonds, Effect on physical properties	Conventional Teaching		CO 3
Module 4 - Nuclear Chemistry (9h) (SD)				
23	Introduction to nuclear chemistry Structure of nucleus <ul style="list-style-type: none"> ➤ Nuclear particles, nuclear forces, nuclear size, nuclear density 	Conventional Teaching		CO 4
24	Stability of nucleus <ul style="list-style-type: none"> ➤ binding energy ➤ magic numbers ➤ packing fraction ➤ n/p ratio. Nuclear Models	Conventional Teaching		CO 4
25	Natural Radioactivity <ul style="list-style-type: none"> ➤ modes of decay, decay constant ➤ half-life period, average life 	Conventional Teaching		CO 4
26	Radioactive Equilibrium Geiger-Nuttall rule, units of radioactivity, radiation dosage	Conventional Teaching		CO 4

27	Nuclear Reactions ➤ induced by charged projectiles, neutrons and γ rays	Conventional Teaching	Q & A session	CO 4
28	Fission reactions Fusion reactions	Conventional Teaching		CO 4
29	Preparation of transuranic elements	Conventional Teaching		CO 4
30	Chain Reactions, Stellar energy	Conventional Teaching ICT		CO 4
31	Problems	Conventional Teaching		CO 4
Module 5 - Analytical Chemistry II (5h) (JRJ)				
32	Gravimetric analysis: Systematic steps in gravimetric analysis. Illustrations using iron and barium estimation.	Conventional Teaching		CO 5
33	Separation and purification techniques – Filtration, Crystallization and precipitation – Fractional distillation, Solvent extraction.	Conventional Teaching ASSIGNMENT II	Q & A session	CO 5
34	Concept of solubility product as applied in group separation of cations – problems.	Conventional Teaching		CO 5
35	Chromatography - Classification of methods elementary study of adsorption, paper, thin layer, column, ion exchange chromatography	Conventional Teaching		CO 5
36	Gas chromatographic methods. HPLC	Conventional Teaching		CO 5

INDIVIDUAL ASSIGNMENTS/SEMINAR – Details & Guidelines

	Date Of Completion	Topic Of Assignment & Nature Of Assignment (Individual/Group – Written/Presentation – Graded Or Non-Graded Etc)	Course Outcome
1	04/01/2019	Shapes of Molecules	CO 2
2	28/01/2019	Problems based on Nuclear Chemistry	CO 4

GROUP ASSIGNMENTS/ACTIVITIES – Details & Guidelines

	Date of completion	Topic of Assignment & Nature of assignment (Individual/Group – Written/Presentation – Graded or Non-graded etc)	Course Outcome
1	02/03/2019	Chromatographic techniques	CO 5

REFERENCES

1. B.R. Puri, L.R. Sharma and K.C. Kalia, *Principles of Inorganic Chemistry*, 31st Edition, Milestone Publishers and Distributors, New Delhi, 2013.
2. Satya Prakash, *Advanced Inorganic Chemistry, Volume 1*, 5th Edition, S. Chand and Sons, New Delhi, 2012.
3. Manas Chanda, *Atomic Structure and Chemical Bonding*, 4th Edition, Tata McGraw Hill
4. Vogel's Textbook of Quantitative Chemical Analysis 6th edn, Pearsons Education Ltd
5. R. D. Day, A. L. Underwood, *Quantitative analysis*, 6th Edn., Prentice Hall of India Pvt. Ltd
6. H. J. Arnikar, *Essentials of Nuclear Chemistry*, New Age
7. R. Gopalan, *Elements of Nuclear Chemistry*, Vikas Publ. House.
8. B.R. Puri, L.R. Sharma and K.C. Kalia, *Principles of Inorganic Chemistry*, 31st Edition, Milestone Publishers and Distributors, New Delhi, 2013.

COURSE PLAN

PROGRAMME	BACHELOR OF SCIENCE IN CHEMISTRY	SEMESTER	2
COURSE CODE AND TITLE	15U2CPPHY2: ELECTRIC AND MAGNETIC PHENOMENA, THERMODYNAMICS AND SOLID STATE PHYSICS	CREDIT	2
THEORY HOURS/WEEK	2	HOURS/SEM	36
FACULTY NAME	DR. MATHEW GEORGE & DR. PIUS AUGUSTINE		

	COURSE OUTCOMES	PO/ PSO	CL
CO 1	Understanding the concepts of electric phenomena	PO1, PSO1	U/An
CO 2	Understanding the concepts of magnetic phenomena	PO1, PSO1	U/An
CO 3	Understanding the concepts of thermodynamics	PO1, PSO1	U/An
CO 4	Understanding the concepts of solid state physics	PO1, PSO1	U/An

CL* Cognitive Level

SESSIO N	TOPIC	LEARNING RESOURC ES	VALUE ADDITION S	COURSE OUTCOME
1	Introduction to dielectrics	Lecture	Q & A Session	CO1
2	Polar and non polar dielectrics	Lecture		CO1
3	Polarization	Lecture		CO1
4	Gauss law in dielectrics	Lecture		CO1
5	Permittivity	Lecture		CO1
6	Dielectric displacement vector	Lecture		CO1
7	Dielectric constant susceptibility and ferroelectricity	Lecture		CO1
8	Introduction	Lecture		CO2
9	Magnetization in materials	Lecture	Q & A Session	CO2
10	Linear and nonlinear materials	Lecture		CO2
11	Magnetism, types	Lecture		CO2
12	Hysteresis	Lecture		CO2

13	Ferromagnetic domains	Lecture		CO2
14	Antiferromagnetism, ferrimagnetism	Lecture		CO2
15	Review, problem solving	Lecture		CO2
16	Solids, crystalline and amorphous	Lecture	Q & A Session	CO4
17	Lattice, basis, unit cell	Lecture		CO4
18	Lattice parameters	Lecture		CO4
19	Crystal systems	Lecture		CO4
20	Crystal planes and directions	Lecture		CO4
21	Miller indices, SC structure	Lecture		CO4
22	Fcc, bcc, hcp structures	Lecture		CO4
23	Packing fraction, NaCl structure	Lecture		CO4
24	Crystal diffraction, Bragg's law	Lecture		CO4
25	Review	Lecture		CO4
26	Thermodynamic systems- thermodynamic equilibrium	Lecture	Q & A Session	CO 3
27	Thermodynamic processes- isothermal process-adiabatic process	Lecture		CO 3
28	Zeroth law of thermodynamics	Lecture		CO 3
29	First law of thermodynamics	Lecture		CO 3
30	Heat engine	Lecture		CO 3
31	Heat engine	Lecture + Video		CO 3
32	The Carnot engine	Lecture + PPT	Q & A Session	CO 3
33	The Carnot engine + Problem solving	Lecture + Group Activity		CO 3
34	Refrigerator concept of entropy	Lecture		CO 3
35	Second law of thermodynamics	Lecture		CO 3
36	Third law of thermodynamics and Maxwell's thermodynamic relations	Lecture		CO 3

REFERENCES

1. Thermodynamics- Zemansky and Dittmann (Tata McGraw-Hill)
2. Heat and Thermodynamics- Brijlal and Subrahmanyam (S. Chand &Co)
3. Solid State Physics

COURSE PLAN

PROGRAMME	BACHELOR OF SCIENCE IN CHEMISTRY	SEMESTER	2
COURSE CODE AND TITLE	15U2CPMAT02 : INTEGRAL CALCULUS AND MATRICES	CREDIT	3
HOURS/WEEK	4	HOURS/SEM	60
FACULTY NAME	MR. SANIL JOSE		

	COURSE OUTCOMES	PO/ PSO	CL
CO 1	Understand definite integrals and The fundamental theorem of Calculus	PSO2	U
CO 2	Determine the area and volume of surfaces in space.	PSO2	A
CO 3	Understand the concepts of Double Integrals	PSO2	U
CO 4	Apply the concepts of multiple integrals to find the area and volume of regions in space	PSO2 , PSO 4	Ap
CO 5	Understand the concepts of matrices	PO1, PSO2	U
CO 6	Apply the concepts of matrices to solve system of linear equations and characteristic roots	PO1, PSO2	AP

CL* Cognitive Level

SESSIONS	TOPIC	LEARNING RESOURCES	VALUE ADDITIONS	COURSE OUTCOME
1	Introductory Session	Discussion	Q & A Session	
2	A quick review of indefinite integral as anti derivative.	Lecture, Group Discussion, Problem Solving		CO 1
3	A quick review of indefinite integral as anti derivative.	Lecture, Group Discussion, Problem Solving		CO 1
4	The Definite integral.	Lecture, Group Discussion, Problem Solving		CO 1
5	The Definite integral.	Lecture, Group Discussion, Problem Solving		CO 1
6	The Definite integral.	Lecture, Group	Q & A	CO 1

		Discussion, Problem Solving	Session	
7	The Definite integral.	Lecture, Discussion, Solving	Group Problem	CO 1
8	Fundamental theorem of Calculus	Lecture, Discussion, Solving	Group Problem	CO 1
9	Fundamental theorem of Calculus	Lecture, Discussion, Solving	Group Problem	CO 1
10	Fundamental theorem of Calculus	Lecture, Discussion, Solving	Group Problem	Q & A Session CO 1
11	Fundamental theorem of Calculus	Lecture, Discussion, Solving	Group Problem	CO 1
12	Fundamental theorem of Calculus	Lecture, Discussion, Solving	Group Problem	CO 1
13	Substitution and area between curves	Lecture, Discussion, Solving	Group Problem	CO 2
14	Substitution and area between curves	Lecture, Discussion, Solving	Group Problem	CO 2
15	Substitution and area between curves	Lecture, Discussion, Solving	Group Problem	CO 2
16	Substitution and area between curves	Lecture, Discussion, Solving	Group Problem	CO 2
17	Volumes by slicing and rotation about an axis (disc method only)	Lecture, Discussion, Solving	Group Problem	CO 2
18	Volumes by slicing and rotation about an axis (disc method only)	Lecture, Discussion, Solving	Group Problem	CO 2
19	Volumes by slicing and rotation about an axis (disc method only)	Lecture, Discussion, Solving	Group Problem	CO 2
20	Volumes by slicing and	Lecture,	Group	CO 2

	rotation about an axis (disc method only)	Discussion, Problem Solving		
21	Volumes by slicing and rotation about an axis (disc method only)	Lecture, Group Discussion, Problem Solving	Quiz	CO 2
22	Areas of surfaces of revolution and the theorem of Pappus (excluding theorem of Pappus)	Lecture, Group Discussion, Problem Solving		CO 2
23	Areas of surfaces of revolution and the theorem of Pappus (excluding theorem of Pappus)	Lecture, Group Discussion, Problem Solving		CO 2
24	Areas of surfaces of revolution and the theorem of Pappus (excluding theorem of Pappus)	Lecture, Group Discussion, Problem Solving	Q & A Session	CO 2
25	Areas of surfaces of revolution and the theorem of Pappus (excluding theorem of Pappus)	Lecture, Group Discussion, Problem Solving		CO 2
26	Double Integrals	Lecture, Group Discussion, Problem Solving		CO 3
27	Double Integrals	Lecture, Group Discussion, Problem Solving	Quiz	CO 3
28	Area of bounded region in plane only	Lecture, Group Discussion, Problem Solving		CO 3
29	Area of bounded region in plane only	Lecture, Group Discussion, Problem Solving		CO 3
30	Area of bounded region in plane only	Lecture, Group Discussion, Problem Solving		CO 3
31	Area of bounded region in plane only	Lecture, Group Discussion, Problem Solving		CO 3

32	Double Integrals in Polar form,	Lecture, Discussion, Solving	Group Problem		CO 3
33	Double Integrals in Polar form,	Lecture, Discussion, Solving	Group Problem		CO 3
34	Double Integrals in Polar form,	Introduction			CO 3
35	Triple integrals in rectangular co-ordinates	Lecture, Discussion, Solving	Group Problem		CO 4
36	Triple integrals in rectangular co-ordinates	Lecture, Discussion, Solving	Group Problem		CO 4
37	Volume of a region in space	Lecture, Discussion, Solving	Group Problem		CO 4
38	Volume of a region in space	Lecture, Discussion, Solving	Group Problem		CO 4
39	Volume of a region in space	Lecture, Discussion, Solving	Group Problem	Q & A Session	CO 4
40	Rank of a Matrix	Lecture, Discussion, Solving	Group Problem		CO 5
41	Non-Singular and Singular matrices	Lecture, Discussion, Solving	Group Problem		CO 5
42	Elementary Transformations	Lecture, Discussion, Solving	Group Problem		CO 5
43	Elementary Transformations	Lecture, Discussion, Solving	Group Problem		CO 5
44	Inverse of an elementary Transformations	Lecture, Discussion, Solving	Group Problem		CO 5
45	Equivalent matrices,	Lecture, Discussion, Solving	Group Problem		CO 5
46	Row Canonical form	Lecture, Discussion,	Group Problem		CO 5

		Solving		
47	Row Canonical form	Lecture, Discussion, Solving	Group Problem	CO 5
48	Normal form	Lecture, Discussion, Solving	Group Problem	CO 5
49	Normal form	Lecture, Discussion, Solving	Group Problem	CO 5
50	System of non homogeneous	Lecture, Discussion, Solving	Group Problem	CO 6
51	Solution using matrices	Lecture, Discussion, Solving	Group Problem	CO 6
52	Solution using matrices	Lecture, Discussion, Solving	Group Problem	CO 6
53	Cramer's rule	Lecture, Discussion, Solving	Group Problem	CO 6
54	Cramer's rule	Lecture, Discussion, Solving	Group Problem	CO 6
55	System of homogeneous equations	Lecture, Discussion, Solving	Group Problem	CO 6
56	Characteristic equation of a matrix; Characteristic roots and characteristic vectors	Lecture, Discussion, Solving	Group Problem	CO 6
57	Cayley-Hamilton theorem and simple applications	Lecture, Discussion, Solving	Group Problem	CO 6
58	Cayley-Hamilton theorem and simple applications	Lecture, Discussion, Solving	Group Problem	CO 6
59	Revision			CO 6
60	Revision			

INDIVIDUAL ASSIGNMENTS/SEMINAR – Details & Guidelines

	Date of completion	Topic of Assignment & Nature of assignment (Individual/Group – Written/Presentation – Graded or Non-graded etc)	Couse Outcome
1	4/1/2019	INTEGRATION PROBLEMS	CO 1, CO 2
2	28/1/2019	PROBLEMS IN MATRICES	CO 5, CO 6

GROUP ASSIGNMENTS/ACTIVITES – Details & Guidelines

	Date of completion	Topic of Assignment & Nature of assignment (Individual/Group – Written/Presentation – Graded or Non-graded etc)	Couse Outcome
1	2/2/2019	PROBLEMS IN MULTIPLE INTEGRATION	CO 3, CO 4

REFERENCES

- George B. Thomas, Jr: Thomas' Calculus Eleventh Edition, Pearson, 2008.
- Frank Ayres Jr: Matrices, Schaum's Outline Series, TMH Edition.
- Shanti Narayan, P .K . Mittal : Integral Calculus (S. Chand & Company)
- Shanthi Narayanan & P.K. Mittal, A Text Book of Matrices, S. Chand.
- David W. Lewis - Matrix Theory (Allied)