

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 2018-19

| | | | |
|---------------------|--|-----------|----|
| PROGRAMME | B.Sc. Chemistry | SEMESTER | 2 |
| COURSE CODE & TITLE | 15U2CCENG3: CRITICAL THINKING, ACADEMIC WRITING AND PRESENTATION | CREDIT | 4 |
| HOURS/WEEK | 5 | HOURS/SEM | 72 |
| FACULTY NAME | TOM C. THOMAS | | |

| | COURSE OUTCOMES | PO | PSO |
|------|---|-----------|------------|
| 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. | 1,2,5 | 2,4 |
| CO 2 | Develops appropriate and impressive writing styles for various contexts | 1,2,6 | 1,2,,4 |
| CO 3 | Write and correct structural imperfections and edit what they have written. | 1,2,5 | 1,3, |
| CO 4 | Develops capacity for making academic presentations effectively and impressively | 1,2,5 | 2,4 |
| CO 5 | Synthesize information from various written sources and present them in the form of summaries. | 1,2,6 | 2,3,4 |
| CO6 | Write original literary creations in different genres as directed, with/without using prompts. | 2,3,4,6 | 1,3 |

| | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PSO 1 | PSO 2 | PSO 3 | PSO 4 |
|------|------|------|------|------|------|------|-------|-------|-------|-------|
| CO 1 | 1 | 3 | 0 | 0 | 1 | 0 | 0 | 3 | 0 | 2 |
| CO 2 | 3 | 3 | 0 | 0 | 0 | 2 | 2 | 3 | 0 | 2 |
| CO 3 | 2 | 3 | 0 | 0 | 1 | 0 | 3 | 0 | 3 | 0 |
| CO 4 | 3 | 2 | 0 | 0 | 1 | 0 | 0 | 3 | 0 | 2 |
| CO 5 | 2 | 2 | 0 | 0 | 0 | 1 | 0 | 3 | 3 | 2 |
| CO 6 | 0 | 3 | 2 | 1 | 0 | 2 | 2 | 0 | 3 | 0 |

Weight Indicators: 0 - No Mapping strength, 1 - Low, 2 - Medium, 3 - High

| SESSION | TOPIC | LEARNING RESOURCES | COURSE OUTCOME |
|---------|--|---------------------------|----------------|
| | MODULE I | | |
| 1 | Introduction to Critical Thinking | Lecture/PPT | CO 1,2 |
| 2 | Introduction to Critical Thinking | Lecture/PPT | CO 1,2 |
| 3 | Introduction to Critical Thinking | Lecture/PPT | CO 1,2 |
| 4 | Introduction to Critical Thinking | Lecture/PPT | CO 1,2 |
| 5 | Reasoning and Arguments | Activities/ Discussion | CO 1,2 |
| 6 | Reasoning and Arguments | Activities/ Discussion | CO 1,2 |
| 7 | Reasoning and Arguments | Activities/ Discussion | CO 1,2 |
| 8 | Reasoning and Arguments | Activities/ Discussion | CO 1,2,6 |
| 9 | Reasoning and Arguments | Activities/ Discussion | CO 1,2,6 |
| 10 | Reasoning and Arguments | Activities/ Discussion | CO 1,2,6 |
| 11 | Deductive and Inductive Arguments | Course book | CO 1, 2 |
| 12 | Deductive and Inductive Arguments | Course book | CO 1 |
| 13 | Deductive and Inductive Arguments | Course book | CO 1 |
| 14 | Deductive and Inductive Arguments | Course book | CO 1 |
| 15 | Deductive and Inductive Arguments | Course book | |
| 16 | Fallacies | | |
| 17 | Fallacies | Course book | CO 1,2 |
| 18 | Inferential Comprehension | Group Activities | CO 1,2 |
| 19 | Inferential Comprehension | Group Activities | CO 1,2 |
| 20 | Inferential Comprehension | Group Activities | CO 2,3 |
| 21 | Inferential Comprehension | Course book | CO 2,3 |
| 22 | Inferential Comprehension | Group Activities | CO 2,3 |
| 23 | Inferential Comprehension | Group Activities | |
| 24 | Critical Thinking and Academic Writing | Group Activities | CO 2,3 |
| 25 | Critical Thinking and Academic Writing | Group Activities | CO 2,3 |
| 26 | Critical Thinking and Academic Writing | Group Activities | CO 2,3 |
| | INTERNAL ASSESSMENT TEST 1 | | |
| 27 | Writing Models | Presentation | CO 3,4,5 |
| 28 | Writing Models | Course book | CO 3,4,5 |

| | | | |
|----|-----------------------------------|-------------|----------|
| 29 | Writing Models | | |
| 30 | Writing Models | Course book | CO 3,4,5 |
| 31 | Writing Models | Course book | CO 3,4,5 |
| 32 | Writing Letters | | |
| 33 | Writing Letters | Course book | CO 3,4,5 |
| 34 | Writing Letters | Course book | CO 3,4,5 |
| 35 | Writing Letters | | |
| 36 | Writing a Letter to the Editor | Course book | CO 3,4 |
| 37 | Writing a Letter to the Editor | Course book | CO 3,4 |
| 38 | Writing a Letter to the Editor | | CO 3,4,5 |
| 39 | Writing a Letter to the Editor | Course book | CO 2,3 |
| 40 | Letter to the Editor | Course book | CO 2,3 |
| 41 | Letter to the Editor | Course book | CO 3,4,5 |
| 42 | Resume Writing | | CO 3,4,5 |
| | MODULE III | | |
| 43 | Covering Letter | Lecture | CO 3,4,5 |
| 44 | Covering Letter | Lecture | CO 3,4,5 |
| 45 | Emails | Course book | CO 3,4,5 |
| 46 | Emails | Course book | CO 3,4,5 |
| 47 | Interview Skills | | |
| 48 | Interview Skills | Course book | CO 3,4, |
| 49 | Interview Skills | Course book | CO 4,5 |
| 50 | Group Discussion | | |
| 52 | Group Discussion | Course book | CO 4,5 |
| 53 | Accuracy in Academic writing | Course book | CO 4,5 |
| 54 | Accuracy in Academic writing | Course book | CO 4,5 |
| 55 | Accuracy in Academic writing | | CO 4,5 |
| 56 | Articles and Determiners | Course book | CO 4,5 |
| 57 | Articles and Determiners | Course book | CO 4,5 |
| 58 | Nouns and Pronouns | | |
| 59 | Subject-verb agreement | Lecture | CO 4,5 |
| 60 | Phrasal verbs | Lecture | CO 5 |
| 61 | Modals | | |
| 62 | Tenses | Course book | CO 3,5 |
| 63 | Tenses | Course book | CO 3,5 |
| 64 | Tenses | | |
| 65 | Conditional clauses | Course book | CO 3,5 |
| 66 | Relative Pronouns | Course book | CO 3,5 |
| 67 | Passive Voices | | |
| | INTERNAL ASSESSMENT TEST 2 | | |
| 68 | Conjunctions | Lecture | CO 3,5 |
| 69 | Embedded questions | Course book | CO 3,5 |

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|----|--|---------------------|--------|
| 70 | Embedded questions | Course book | CO 3,5 |
| 71 | Punctuations and Abbreviations | | CO 3,5 |
| 72 | Soft skills for academic presentations | Course book | CO 3,5 |
| 73 | Effective communication skills | Course book | CO 3,5 |
| 74 | Flip Charts, OHP, Power point presentation | Group Presentations | CO 3,5 |
| 75 | Clarity and brevity in presentation | Group Presentations | |
| 76 | Interaction and persuasion | Group Presentations | |
| 77 | Interview skills | Group Presentations | |
| 78 | Interview skills | Group Presentations | |
| 79 | Interview skills | Group Presentations | |
| 80 | Group Discussion | Group Presentations | |
| 81 | Group Discussion | Group Presentations | |
| 82 | Group Discussion | Group Presentations | |
| 83 | Group Discussion | Group Presentations | |
| 84 | Group Discussion | Group Presentations | |
| 85 | Group Discussion | Group Presentations | |
| 86 | Review Session 1 | | |
| 87 | Review Session 1 | | |
| 88 | Review Session 2 | | |
| 89 | Review Session 3 | | |
| 90 | Review Session 4 | | |

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 | 4/1/2019 | Writing Tasks- Different Types of Letters | CO 2 |
| 2 | 28/02/2019 | | CO 3 |

GROUP ASSIGNMENTS/ACTIVITES – Details & Guidelines

| | Date of completion | Topic of Assignment & Nature of assignment (Individual/Group – Written/Presentation – Graded or Non-graded etc) | Course Outcome |
|---|--------------------|--|----------------|
| 1 | 2/02/2019 | Brochure design | CO 5 |
| 2 | 15/1/19 | Model Slide Presentation | CO 5 |

COURSE PLAN: 2018-19

| | | | |
|-----------------------|-------------------------------------|-----------|----|
| PROGRAMME | UG COMMON COURSE | SEMESTER | 2 |
| COURSE CODE AND TITLE | 15U2CCENG4: MUSINGS ON VITAL ISSUES | CREDIT | 2 |
| HOURS/WEEK | 4 | HOURS/SEM | 72 |
| FACULTY NAME | BIJO N MATHEW, TOM C. THOMAS | | |

| | COURSE OUTCOMES | PO/ PSO | CL |
|------|--|--------------------------------------|-----------|
| CO 1 | Appreciate inspirational literatures of various literary genres across cultures | PO1,PO2, PSO1,PSO2 | U |
| CO 2 | Critically engage with literary texts written in different languages and later translated into English | PO1, PO2, PSO1,PSO3 | An |
| CO 3 | Critically engage with biographical sketch of the authors and familiarize their personality, oeuvre and style. | PO1, PO2, PO3, PSO4 | An |
| CO 4 | Develop a creative and insightful perspective towards life | PO1, PO2, PO3,PO4,PO5 PSO3, PSO 4 | A |
| CO 5 | Apply the unfathomable power of literatures in their writings and creative endeavors. | PO1, PO2, PO5, PSO1, PSO 2, PSO3 | A |

CL* Cognitive Level

R- Remember

U- Understand

A- Apply

An- Analyze

E- Evaluate

Cr- Create

CO - PO/PSO Mapping

| | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PSO 1 | PSO 2 | PSO 3 | PSO 4 |
|------|------|------|------|------|------|------|-------|-------|-------|-------|
| CO 1 | 2 | 2 | 0 | 0 | 0 | 0 | 1 | 3 | 0 | 0 |
| CO 2 | 2 | 1 | 0 | 0 | 0 | 0 | 3 | 0 | 3 | 0 |
| CO 3 | 3 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| CO 4 | 1 | 1 | 3 | 3 | 1 | 0 | 0 | 0 | 1 | 3 |
| CO 5 | 2 | 2 | 0 | 0 | 3 | 0 | 2 | 3 | 3 | 0 |

Mapping Strength

- 0- No Mapping strength
- 1- Low
- 2- Medium
- 3- High

| SESSION | TOPIC | LEARNING RESOURCES | VALUE ADDITIONS | COURSE OUTCOME |
|---|--|--------------------|-----------------|----------------|
| MODULE I –GLOBALIZATION AND ITS CONSEQUENCES | | | | |
| 1 | Fritjof Capra : “The Dark Side of Growth” | PPT/Lecture | video | CO 1 |
| 2 | Fritjof Capra : “The Dark Side of Growth” | PPT/Lecture | video | CO 1,2 |
| 3 | Fritjof Capra : “The Dark Side of Growth” | Lecture | | CO 1,6 |
| 4 | Joseph Stiglitz : “Globalization” | lecture | | |
| 5 | Joseph Stiglitz : “Globalization” | PPT/Lecture | video | CO 1 |
| 6 | Joseph Stiglitz : “Globalization” | PPT/Lecture | | CO 1 |
| 7 | D H Lawrence : “Money Madness” | Lecture | | CO 1,6 |
| 8 | S Joseph : “For the Dispossessed” | Lecture | | |
| 9 | S Joseph : “For the Dispossessed” | PPT/Lecture | video | CO 1 |
| 10 | S Joseph : “For the Dispossessed” | PPT/Lecture | | CO 1 |
| 11 | Vandana Shiva : “The Social Costs of Economic Globalization” | Lecture | | CO 1,6 |
| 12 | Vandana Shiva : “The Social Costs of Economic Globalization” | Lecture | | |
| 13 | Vandana Shiva : “The Social Costs of Economic Globalization” | PPT/Lecture | video | CO 1 |
| 14 | Jagannath Prasad Das : “Kalahandi” | PPT/Lecture | | CO 1,3 |
| 15 | Jagannath Prasad Das : “Kalahandi” | Lecture | | |
| 16 | Jagannath Prasad Das : “Kalahandi” | Lecture | | CO 1,6 |
| 17 | Leah Levin : “Universal Declaration of Human Rights” | PPT/Lecture | video | CO 1 |
| 18 | Leah Levin : “Universal Declaration of Human Rights” | PPT/Lecture | | CO 1 |

| | | | | |
|------------------------------------|--|------------------------|-------|----------|
| 19 | Leah Levin : “Universal Declaration of Human Rights” | Lecture | | CO 1,6 |
| 20 | Nani A Palkivala : “Human Rights and Legal Responsibilities” | PPT/Lecture | video | CO 1 |
| 21 | Nani A Palkivala : “Human Rights and Legal Responsibilities” | Lecture | | CO 1,6 |
| 22 | Nani A Palkivala : “Human Rights and Legal Responsibilities” | Lecture | | |
| 23 | Martin Luther King : “I Have a Dream” | Lecture | | |
| 24 | Martin Luther King : “I Have a Dream” | Discussion | | |
| 25 | Martin Luther King : “I Have a Dream” CIA – I | | | |
| MODULE II- HUMAN RIGHTS | | | | |
| 26 | Kalpana Jain : “Stigma, Shame and Silence” | PPT/Lecture | | CO 2, 3 |
| 27 | Kalpana Jain : “Stigma, Shame and Silence” | Lecture | video | CO 2 |
| 28 | Kalpana Jain : “Stigma, Shame and Silence” | Lecture | | CO 2,6 |
| 29 | Wole Soyinka : “Telephone Conversation” | Lecture | | |
| 30 | Wole Soyinka : “Telephone Conversation” | PPT/Lecture | | CO 2,3 |
| 31 | Richard Wright : “Twelve Million Black Voices” | Lecture | video | CO 2 |
| 32 | Richard Wright : “Twelve Million Black Voices” | Lecture | | CO 2,6 |
| 33 | Richard Wright : “Twelve Million Black Voices” | Lecture | | |
| 34 | Aruna Roy : “Tune in to the Voice of the Deprived” | PPT/Lecture | | CO 2,3 |
| 35 | Aruna Roy : “Tune in to the Voice of the Deprived” | Lecture | video | CO 2 |
| 36 | Aruna Roy : “Tune in to the Voice of the Deprived” | Lecture | | CO 2,6 |
| 37 | Johannes V. Jensen : “Lost Forests” | Lecture | | |
| 38 | Johannes V. Jensen : “Lost Forests” | PPT/Lecture | | CO 2,3 |
| 39 | Johannes V. Jensen : “Lost Forests” | Lecture | video | CO 2,6 |
| 40 | Omprakash Valmiki : “Joothan” | Lecture | | |
| 41 | Omprakash Valmiki : “Joothan” | Discussion | | |
| 42 | Omprakash Valmiki : “Joothan” | Presentation | | |
| MODULE –III Gender Question | | | | |
| 43 | Jamaica Kincaid : “Girl” | Presentation | | |
| 44 | Jamaica Kincaid : “Girl” | Presentation | | |
| MODULE III- GENDER QUESTION | | | | |
| 45 | Jamaica Kincaid : “Girl” | Lecture | Video | |
| 46 | Taslima Nasrin : “At the Back of Progress” | Discussion | | CO1, CO6 |
| 47 | Taslima Nasrin : “At the Back of Progress” | | | CO1 |
| 48 | Taslima Nasrin : “At the Back of Progress” | | | CO 3, 1 |
| 49 | Judy Brady : “Why I Want a Wife” | Lecture | Video | CO 3,5 |
| 50 | Judy Brady : “Why I Want a Wife” | Lecture, discussion | | CO 3,6 |
| 51 | Judy Brady : “Why I Want a Wife” | Lecture, | | CO 3,1 |

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|---------|--|------------------------|-------|---------|
| | | discussion | | |
| 52 | J B Priestley : “Mother’s Day” | Lecture, discussion | | CO 4,5 |
| 53 | J B Priestley : “Mother’s Day” | Lecture | | CO 4,6 |
| 54 | J B Priestley : “Mother’s Day” | Discussion | Video | |
| 55 | J B Priestley : “Mother’s Day” | Lecture | | CO 4,1 |
| 56 | Amartya Sen : “More Than 100 Million Women are Missing | Lecture | | CO 4,5 |
| 57 | Amartya Sen : “More Than 100 Million Women are Missing | Presentation | | CO 4,6 |
| 58 | Amartya Sen : “More Than 100 Million Women are Missing | Presentation | | CO 3, 1 |
| 59 | Amartya Sen : “More Than 100 Million Women are Missing | Presentation | | CO 3, 1 |
| 60 - 72 | Revision | | | |

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 | 2/8/2018 | Presentations | CO 2 |
| 2 | 28/8/2018 | Role Plays | CO 3 |

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 | 12/9/2018 | Group Discussions | CO 5 |
| 2 | 20/9/2018 | Performances | CO 4 |

References

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

COURSE PLAN

| | | | |
|-----------------------|--|-----------|----|
| PROGRAMME | BACHELOR OF SCIENCE – CHEMISTRY | SEMESTER | 2 |
| COURSE CODE AND TITLE | 15U2CCHIN2A - TRANSLATION, CORRESPONDENCE, ESSAYS AND APPLIED GRAMMAR (SEM II) | CREDIT | 4 |
| HOURS/WEEK | 4 | HOURS/SEM | 72 |
| FACULTY NAME | Dr. MINIPRIYA R, SYAMLAL M. S | | |

| | COURSE OUTCOMES | PO/ PSO | CL |
|------|---|------------------------|------|
| CO 1 | Recognize and get introduced to the minor genres such as essay to develop their social and moral sense in life. | PO1,PO2, PO 3,PO4 ,PO6 | U,Cr |
| CO 2 | Define grammatical structure of Hindi language and analyse the problems, challenges of communication in Hindi. | PO2, PO6, PSO 2 | U |
| CO 3 | Use Hindi language for effective communication in different fields like administration, office proceedings, insurance etc. | PO1, PO2, PO6,PSO 2 | A |
| CO 4 | Understand translation as a linguistic, communicative and cultural activity. | PO2, PO5, PO6, PSO 2 | U |
| CO 5 | Acquire skills of correspondence, drafting official and scientific documents in the fields of administration, media and business. | PO1, PO2, PO6, PSO 2 | A |

CL* Cognitive Level

R- Remember

U- Understand

A- Apply

An- Analyze

E- Evaluate

Cr- Create

CO - PO/PSO Mapping

| | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PSO 1 | PSO 2 | PSO 3 | PSO 4 |
|------|------|------|------|------|------|------|-------|-------|-------|-------|
| CO 1 | 2 | 2 | 1 | 2 | | 1 | | | | |
| CO 2 | | 2 | | | | 2 | | 2 | | |
| CO 3 | 2 | 2 | | | | 2 | | 2 | | |
| CO 4 | | 2 | | | 1 | 2 | | 2 | | |
| CO 5 | 2 | 2 | | | | 1 | | 2 | | |

Mapping Strength

- 0- No Mapping strength
- 1- Low
- 2- Medium
- 3- High

| SESSION | TOPIC | LEARNING RESOURCES | VALUE ADDITIONS | COURSE OUTCOME |
|------------------|---|---------------------|-----------------|----------------|
| MODULE I | | | | |
| 1 | Importance of Grammar in Language learning. | Lecture/Discussion | | CO 2 |
| 2 | Part I Vyakaran | Lecture/Discussion | | CO 2 |
| 3 | Part I Vyakaran | Lecture/PPT | | CO 2 |
| 4 | Part I Vyakaran | Lecture | Exercise | CO 2 |
| 5 | Importance of Translation | Lecture/PPT | | CO 4 |
| 6 | Translation | Lecture/PPT | | CO 4 |
| 7 | Translation | Lecture | Exercise | CO 4 |
| 8 | Exercise -Translation | Interaction | Exercise | CO 4 |
| 9 | Importance of Letter writing | Lecture/PPT | | CO 5 |
| 10 | Part II Patra Lekhan | Lecture/Discussion | | CO 5 |
| 11 | Ache Patra Ki Visheshayen | Lecture/PPT | | CO 5 |
| 12 | Importance of Hindi Essays | Interaction | Discussion | CO 1 |
| 13 | Patron Ke Prakar | Lecture | | CO 5 |
| 14 | Nibandh Ke Prakar | Lecture | | CO 1 |
| 15 | Nibandh Ke Prakar | Lecture/PPT | Exercise | CO 2 |
| 16 | Part I Vyakaran | Lecture | | CO 2 |
| 17 | Part I Vyakaran | Interaction | Exercise | CO 2 |
| 18 | Exercise -Translation | Lecture | | CO 4 |
| 19 | Revision | Discussion | | CO 4 |
| 20 | Patron Ke Prakar | Lecture | | CO 5 |
| 21 | Nibandh Ke Ang | Lecture | | CO 1 |
| 22 | Nibandh Lekhan Sambandhi Avashyak Batein | Lecture/Discussion | | CO 1 |
| 23 | Nibandh 1,2 | Lecture/PPT | | CO 1 |
| 24 | CIA – I (1Hour Exam) | | | |
| MODULE II | | | | |
| 25 | Exercise Oriented Grammar | Lecture | | CO 2 |
| 26 | Exercise Oriented Grammar | Lecture/Discussion | Exercise | CO 2 |
| 27 | Exercise Oriented Grammar | Lecture/ Discussion | Exercise | CO 2 |
| 28 | Part II Patra Lekhan, Parivarik Patra | Lecture/PPT | | CO 5 |
| 29 | Part II Patra Lekhan, Parivarik Patra | Interaction | | CO 5 |
| 30 | Exercise -Translation | Lecture | | CO 4 |
| 31 | Exercise -Translation | Lecture/Discussion | | CO 4 |

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|-------------------|--|--------------------------|----------|------|
| 32 | Revision | Interaction | | CO 4 |
| 33 | Exercise Oriented Grammar | Lecture | | CO 2 |
| 34 | Exercise Oriented Grammar | Lecture/ Discussion | Exercise | CO 2 |
| 35 | Part II Patra Lekhan , Nimantran Patra | Lecture/PPT | | CO 5 |
| 36 | Nibandh 3 | Lecture | | CO 1 |
| 37 | Nibandh 3,Exercise | Lecture/ Discussion | | CO 1 |
| 38 | Exercise –Translation | Lecture | | CO 4 |
| 39 | Exercise –Translation | Lecture/ Discussion | | CO 4 |
| 40 | Part II Patra Lekhan, Vyavasayik Patra | Lecture/PPT | | CO 5 |
| 41 | Nibandh 4 | Lecture | | CO 1 |
| 42 | Nibandh 4,Exercise | Lecture/Discussion | Exercise | CO 1 |
| 43 | Nibandh 5 | Lecture/Discussion | | CO 1 |
| 44 | Nibandh 6 | Lecture | | CO 1 |
| 45 | Nibandh 6,Exercise | Lecture/ Discussion | Exercise | CO 1 |
| 46 | Revision | Interaction | | CO 1 |
| 47 | CIA – II (2 Hours Exam) | | | |
| MODULE III | | | | |
| 48 | Exercise Oriented Grammar | Lecture/PPT | | CO2 |
| 49 | Exercise Oriented Grammar | Lecture | Exercise | CO2 |
| 50 | Nibandh 7 | Lecture | | CO 1 |
| 51 | Nibandh 7, Exercise | Lecture/Discussion | Exercise | CO 1 |
| 52 | Part II Patra Lekhan, Adhikarik Patra | Lecture/PPT | | CO 5 |
| 53 | Part II Patra Lekhan, Adhikarik Patra | Lecture/ Discussion | | CO 5 |
| 54 | Exercise –Translation | Lecture | | CO 4 |
| 55 | Exercise –Translation | Lecture/Discussion | | CO 4 |
| 56 | Nibandh 8 | Lecture | | CO 1 |
| 57 | Nibandh 8,Exercise | Lecture/ Discussion | | CO 1 |
| 58 | Exercise –Translation | Lecture | | CO 4 |
| 59 | Exercise Oriented Grammar | Lecture/PPT | | CO2 |
| 60 | Exercise Oriented Grammar | Lecture | Exercise | CO2 |
| 61 | Part II Patra Lekhan, Shikayati Patra | Lecture/Discussion | | CO 5 |
| 62 | Nibandh 9 | Lecture | | CO 1 |
| 63 | Nibandh 9,Exercise | Lecture/ Discussion | | CO 1 |
| 64 | Exercise - Translation | Lecture | | CO 4 |
| 65 | Part II Patra Lekhan , Karyalayi Patra | Lecture/PPT | | CO 5 |
| 66 | Nibandh 10 | Lecture | | CO 1 |
| 67 | Nibandh 10,Exercise | Lecture/Discussion | | CO 1 |
| 68 | Seminar | Presentation by students | | CO 2 |
| 69 | Seminar | Presentation by students | | CO 2 |
| 70 | Revision | Interaction | | |
| 71 | Revision | Interaction | | |
| 72 | Evaluation of the course | | | |

INDIVIDUAL ASSIGNMENTS/SEMINAR – Details & Guidelines (B.Sc. CHEMISTRY)

| SL NO | Date of completion | Topic of Assignment & Nature of assignment (Individual/Group – Written/Presentation – Graded or Non-graded etc) | Course Outcome |
|-------|--------------------|---|----------------|
| 1 | January | Exercise activity based on Patra lekhan (Group Discussion) | CO 5 |
| 2 | January | Translation of a passage from English to Hindi.(Group Activity) | CO 4 |

GROUP ASSIGNMENTS/ACTIVITIES – Details & Guidelines

| SL NO | Date of completion | Topic of Assignment & Nature of assignment (Individual/Group – Written/Presentation – Graded or Non-graded etc) | Course Outcome |
|-------|-----------------------|---|----------------|
| 1 | Assignment (February) | Review of a lesson based on the text book , part IV Nibandh and reference- Writing (Individual) | CO 1 |
| 2 | Seminar (February) | Presentation on a given topic based on the text book part I and reference – oral (Individual) | CO 2 |

References

- Hindi vyakaran by Kamta Prasad Guru , Prabhat Prakashan

Web resource references:

- epustakalay.com
- www.hindikunj.com

COURSE PLAN 0

| | | | |
|-----------------------|---|-----------|----|
| PROGRAMME | BSc CHEMISTRY | SEMESTER | 2 |
| COURSE CODE AND TITLE | 15U2CCFRN2A - FRENCH LANGUAGE AND COMMUNICATION SKILLS II | CREDIT | 4 |
| HOURS/WEEK | 4 | HOURS/SEM | 72 |

| | COURSE OUTCOMES | PO/ PSO | CL |
|------|---|--------------------------|----|
| CO 1 | Understand the basic concepts of French language including grammar, vocabulary and sentence structure | PO1,PO2, PO6, PSO2 | U |
| CO 2 | Understand the basic communication skills necessary for living in France and French speaking countries. | PO1, PO5,PO6, PO2,PSO2 | U |
| CO 3 | Describe oneself and ones surroundings using a repertory of words and expressions in a simple and structured grammatical manner. | PO1, PO4, PO6,PSO2 | A |
| CO 4 | Develop business communication skills | PO2, PO4,PO5, PO6,PSO2 | A |
| CO 5 | Express an issue of concern including topics like environmental, social or health issues, enumerate its causes and consequences and suggest solutions | PO1,PO2,PO3,PO5,PO6,PSO2 | A |
| CO 6 | Understand the mannerisms, culture and tradition of France and Francophone countries and compare it to one's own country and develop co-cultural feeling | PO6,PO2,PSO2 | U |
| CO 7 | Understand and appreciate the history of France and Francophone countries and compare it to one's own country | PO2,PO6,PSO2 | U |
| CO 8 | Understand the special features of France including gastronomy, social institutions, policis, the present French scenario and compare it to one's own country | PO1,PO2,PO5,PO6,PSO2 | U |

CL* Cognitive Level

CL* Cognitive Level

R- Remember

U- Understand

A- Apply

An- Analyze

E- Evaluate

Cr- Create

CO - PO/PSO Mapping

| | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PSO 1 | PSO 2 | PSO 3 | PSO 4 |
|------|------|------|------|------|------|------|-------|-------|-------|-------|
| CO 1 | 2 | 2 | | | | 2 | | 1 | | |
| CO 2 | 2 | 2 | | | 2 | 2 | | 1 | | |
| CO 3 | 2 | | | 2 | | 2 | | 1 | | |
| CO 4 | | 2 | | 2 | 2 | 2 | | 1 | | |
| CO 5 | 2 | 2 | 2 | | 2 | 2 | | 1 | | |
| CO6 | | 2 | | | | 2 | | 1 | | |
| CO7 | | 2 | | | | 2 | | 1 | | |
| CO8 | 2 | 2 | | | 2 | 2 | | 1 | | |

Mapping Strength

- 0. No Mapping strength
- 1- Low
- 2- Medium
- 3- High

| SESSION | TOPIC | LEARNING RESOURCES | VALUE ADDITIONS | COURSE OUTCOME |
|-----------------|--|--------------------|-----------------|----------------|
| MODULE I | | | | |
| 1 | Introducing French Basics | Role play, games | | CO 1,2,3 |
| 2 | French Basics | Lecture | | CO 1,2,3 |
| 3 | Pronominal verbs | Games, music | | CO 1,2,3 |
| 4 | Pronominal verbs practice | Games | | CO 1,2,3 |
| 5 | Sentence construction using pronominal verbs | Games | | CO 1,2,3 |
| 6 | Sentence construction | Games | | CO 1,2,3 |
| 7 | Sentence construction | Games | | CO 1,2,3 |
| 8 | Grammar- present tense | Role play | | CO 1,2,3 |

| | | | | |
|-------------------|-----------------------------------|--------------------|--|------------|
| 9 | Communicative skills | Lecture | | CO 1,2,3 |
| 10 | Communicative skills | Role Play | | CO 1,2,3 |
| 11 | Communicative skills | Role Play | | CO 1,2,3 |
| 12 | Narrate a day | Discussions ICT | | CO 6,7,8 |
| 13 | Narrate a day | Discussions | | CO 6,7,8 |
| MODULE II | | | | |
| 14 | Interrogative adjectifs | Game | | CO 2,3 |
| 15 | Interrogative adjectifs | Lecture | | CO2,3 |
| 16 | Demonstrative adjectives | Game | | CO2,3 |
| 17. | Demonstrative Adjectives | Lecture | | CO 2,3 |
| 18. | Sentence construction | Games | | CO 2,3 |
| 19 | Sentence construction | Games | | CO2,3 |
| 20 | civilisation | discussion | | CO 2,3 |
| 21 | Vocabulary building | games | | CO 2,3 |
| 22 | Vocabulary Building | Games | | CO2,3 |
| 23 | Buying a product, French products | Lecture/Discussion | | CO 5,6,7,8 |
| 24 | Buying a product | Role play | | CO 5,6,7,8 |
| 25 | Buying a product | Role play | | CO5,6,7,8 |
| 26 | Revision | | | |
| 27 | Revision | | | |
| 28 | revision | | | |
| 29 | CIA I | | | |
| MODULE III | | | | |

| | | | | |
|----|--------------------------------------|----------------|--|------------|
| 30 | Food vocabulary | PPT/Lecture | | CO 1,2,3 |
| 31 | Food vocabulary | Games | | CO 1,2,3 |
| 32 | Intercultural studies | Discussions | | CO 5,6,7,8 |
| 33 | Sentence construction | Role play | | CO 1,2,3 |
| 34 | Sentence Construction | Games | | CO 1,2,3 |
| 35 | Articles partitifs | music | | CO 3 |
| 36 | Sentence construction(negative form) | games | | CO 3 |
| 37 | Future proche | Lecture | | CO 3 |
| 38 | Future proche | Lecture | | CO 3 |
| 39 | Giving and taking order | Role play | | CO1,2,3 |
| 40 | Ordering at a restaurant | Role play | | CO 1,2,3 |
| 41 | Vocabulary building | Games, music | | CO 1,2,3 |
| 42 | Vocabulary building | Games, Music | | O 1,2,3 |
| 43 | civilisation | PPT/Discussion | | CO 5,6,7,8 |
| 44 | Civilisation | Discussion | | CO 5,6,7,8 |

CIA II

MODULE IV

| | | | | |
|----|-------------------------|---------|--|----------|
| 45 | Past tense (avoir) | Lecture | | CO2,3 |
| 46 | Past tense(etre) | Lecture | | CO 2,3 |
| 47 | Past tense (pronominal) | Lecture | | CO2,3 |
| 48 | Sentence formation | Games | | CO2,3 |
| 49 | Sentence formation | Games | | CO2,3 |
| 50 | Describe a past event | Lecture | | CO 1,2,3 |

| | | | | |
|----|---|----------------------------|--|------------|
| 51 | Narrate your day in the past | communication | | CO1,2,3 |
| 52 | Diary writing | assignment | | CO5,6,7 |
| 53 | Vocabulary building | games | | CO 1,2,3 |
| 54 | Part time jobs, vocabulary | Lecture | | CO 1,2,3 |
| 55 | Part time jobs-ads | Role plays | | CO1,2,3 |
| 56 | Exploring part time jobs | Role play | | CO5,6,7,8 |
| 57 | Putting up an ad and responding to an ad on part-time job | Lecture/Seminar/Discussion | | CO 5,6,7,8 |
| 58 | Putting up an ad and responding to an ad on part-time job | Role play | | CO5,6,7,8 |
| 59 | French culture | Discussion | | CO5,6,7,8 |
| 60 | French Culture | Discussion | | CO5,6,7,8 |
| 61 | French culture | Discussion | | CO5,6,7,8 |
| 62 | French culture | Discussion | | CO5,6,7,8 |
| 63 | DELFPREPARATION | | | |
| 64 | DELFPREPARATION | | | |
| 65 | DELFPREPARATION | | | |
| 66 | DELFPREPARATION | | | |
| 67 | DELFPREPARATION | | | |
| 68 | DELFPREPARATION | | | |
| 69 | DELFPREPARATION | | | |
| 70 | DELFPREPARATION | | | |
| 71 | DELFPREPARATION | | | |
| 72 | DELFPREPARATION | | | |

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 | By February | Presentation on gastronomy of each region | CO 2,3,6,8 |
| 2 | | roleplays | CO 123456 |

References

Version Originale, site web

COURSE PLAN

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

| | COURSE OUTCOMES | PO/ PSO | CL |
|------|---|--------------------------|-----------|
| CO 1 | Developing the basic knowledge in Sanskrit | PO1,PO2, PO6, PSO2 | U |
| CO 2 | Students develop the communication skills in sanskrit | PO1, PO5,PO6,PO2,PSO2 | U |
| CO 3 | Students familiarize the figures of speech and their usage | PO1, PO4, PO6,PSO2 | A |
| CO 4 | Students get an awareness about aesthetic values | PO2, PO4,PO5, PO6,PSO2 | A |
| CO 5 | Students get an awareness about Indian classical poetic tradition | PO1,PO2,PO3,PO5,PO6,PSO2 | A |
| CO 6 | Understand moral values through Drama | PO6,PO2,PSO2 | U |
| CO 7 | Students develop writing skills in Sanskrit | PO2,PO6,PSO2 | U |
| CO 8 | Students get awareness about Verbal forms | PO1,PO2,PO5,PO6,PSO2 | U |

CL* Cognitive Level

R- Remember

U- Understand

B- Apply

An- Analyze

E- Evaluate

Cr- Create

CO -PO/PSO Mapping

| | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PSO 1 | PSO 2 | PSO 3 | PSO 4 |
|------|------|------|------|------|------|------|-------|-------|-------|-------|
| CO 1 | 2 | 2 | | | | 2 | | 1 | | |
| CO 2 | 3 | 3 | | | 2 | 2 | | 2 | | |
| CO 3 | 2 | | | 2 | | | | 1 | | |
| CO 4 | | 2 | | 3 | 2 | 2 | | 1 | 2 | |
| CO 5 | 2 | 2 | 2 | | 2 | 3 | | 1 | | |
| CO6 | | 2 | | | | 3 | | 1 | 1 | |
| CO7 | | 2 | | | | 2 | | 2 | | |
| CO8 | 2 | 2 | | | 2 | 2 | | 1 | 2 | |

Mapping Strength

0. No Mapping strength
1. Low
2. Medium
3. High

| SESSION | TOPIC | LEARNING RESOURCES | VALUE ADDITIONS | COURSE OUTCOME |
|------------------|--------------------------------------|--------------------|-----------------|----------------|
| MODULE I | | | | |
| 1 | Introducing Vibhakthi | Lecture | | CO 1,2 |
| 2 | Prathama vibhakthi | Discussion | | CO 1,2 |
| 3 | Dvitheeya vibhakthi | Lecture | | CO 1,2 |
| 4 | Thritheeya vibhakthi | Lecture | e-resource | CO 1,2 |
| 5 | Chathurthi vibhakthi | Lecture | | CO 1,2 |
| 6 | Panchami vibhakthi | Chalk n talk | | CO 1,2 |
| 7 | Shashti vibhakthi | Lecture | | CO 1,2 |
| 8 | Sapthami vibhakthi | Chalk n talk | | CO 1,2 |
| 9 | Sambhodhanaprathama | Lecture | | CO 1,2 |
| 10 | Akarantha pulinga bala shabha | Lecture | | CO 1,2 |
| 11 | Aakarantha sthreeinga Latha shabdha | Discussion | | CO 1,2 |
| 12 | Ekarantha pulinga Kavi shabdha | Discussion | | CO 1,2 |
| 13 | Ukarantha pulinga Guru shabdha | PPT/Lecture | | CO 1,2 |
| 14 | Revision | | | |
| MODULE II | | | | |
| 15 | Structure of sentence- Present tense | PPT/Lecture | | CO 7,8 |

| | | | | |
|------------|--|--------------|-------|------------|
| 16 | Prathama purusha ekavachaam | Chalk n talk | | CO 7,8 |
| 17 | Prathama purusha dvivachaam | Lecture | | CO 2,7,8 |
| 18 | Prathama purusha bahuvachaam | Lecture | | CO 2,7,8 |
| 19 | Madhyama purusha ekavachaam | Lecture | | CO 2,7,8 |
| 20 | Madhyam purusha dvivachaam | Game | | CO 3,7,8 |
| 21 | Madhyam purusha bahuvachaam | Game | | CO 3,7,8 |
| 22 | Uthamapurusha ekavachaam | PPT/Lecture | | CO 3,7,8 |
| 23 | Uthamapurusha dvivachaam | PPT/Lecture | | CO 3,7,8 |
| 24 | Uthamapurusha bahuvachaam | Lecture | | CO 3,7,8 |
| 25 | Past tense- Prathamapurusha | Lecture | | CO 3,7,8 |
| 26 | CIA-1 | | | |
| 27 | Past tense -Madhyamapurusha | Lecture | | CO 3,5,7,8 |
| 28 | Past tense - Uthamapurusha | Chalk n talk | | CO 3,5,7,8 |
| 29 | Future tense - Prathamapurusha | Chalk n talk | | CO 3,5,7,8 |
| 30 | Future tense - Madhyamapurusha | Discussion | | CO3,5,7,8 |
| 31 | Future tense - Uthamapurusha | Discussion | | CO 3,5,7,8 |
| 32 | Sentence making in Sanskrit-Active voice | Lecture | | CO 7,8 |
| 33 | Sentence making in Sanskrit –Passive voice | Lecture | | CO 7,8 |
| 34 | Revision | | | |
| 35 | Revision | | | |
| MODULE III | | | | |
| 36 | Introduction Meghadootha | Lecture | | CO 3,6,7 |
| 37 | Explaining Khandakavyam | Lecture | | CO 3,6,7 |
| 38 | Yaksha -curse | PPT/Lecture | | CO 3,6,7 |
| 39 | Yaksha's meeting with cloud | PPT/Lecture | | CO 3,6,7 |
| 40 | Requesting to cloud | PPT/Lecture | | CO 3,6,7 |
| 41 | Praising cloud | Lecture | | CO 3,6,7 |
| 42 | Yaksha directing cloud | Lecture | | CO 3,6,7 |
| 43 | Meeting with Balaka bird | Chalk n talk | | CO 3,6,7 |
| 44 | Departure | Discussion | | CO 3,6,7 |
| 45 | Rajahamsa | Roleplay | | CO 3,6,7 |
| 46 | Explaining Mountain | Discussion | | CO 3,6,7 |
| 47 | Directing to Megha | PPT/Lecture | | CO 4,7 |
| 48 | Revision | | | |
| 49 | Revision | | | |
| MODULE IV | | | | |
| 50 | Introduction Mrichakatika drama | PPT/Lecture | | CO 3,6,8 |
| 51 | Charudatha | PPT/Lecture | Video | CO 3,6,8 |
| 52 | Vasanthasena | PPT/Lecture | | CO 3,6,8 |
| 53 | Vasanthasena's visiting | PPT/Lecture | | CO 3,6,8 |
| 54 | Rajasyala Samsthanaka | Lecture | | CO 3,6,8 |

| | | | | |
|----------|---|-------------|------------------|----------|
| 55 | Vasanthasena 's meeting with Charudatha | Lecture | Debate | CO 3,6,8 |
| 56 | Matithreya's conversation with Radanika | PPT/Lecture | | CO 3,6,8 |
| 57 | Rohasena | PPT/Lecture | | CO 3,6,8 |
| 58 | Dvitheeyanka | PPT/Lecture | | CO 3,6,8 |
| 59 | Gambling incident | PPT/Lecture | | CO 3,6,8 |
| 60 | Catching Gambler | PPT/Lecture | | CO 3,6,8 |
| 61 | Escaping | PPT/Lecture | | CO 3,6,8 |
| CIA - II | | | | |
| 62 | Vasanthasena's talk with her servant | | | CO 3,6,7 |
| 63 | thritheeyanka | Lecture | | CO 3,6,8 |
| 64 | Rebhila's music discussion | Lecture | Group discussion | CO 3,4,8 |
| 65 | Sharvilaka –the thief | Lecture | | CO 3,4,8 |
| 66 | Taking gold from Maithreya | PPT/Lecture | | CO 3,4,8 |
| 67 | Charudatha talk with Maithreya | PPT/Lecture | | CO 3,4,8 |
| 68 | Dootha's talking | PPT/Lecture | | CO 3,4,8 |
| 69 | Revision | | | |
| 70 | Revision | | | |
| 71 | Revision | | | |
| 72 | Revision | | | |

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 | By February | Kalidasa's Mahakavyas | CO 6,8 |
| 2 | | Sanskrit Drama | 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) | Course Outcome |
|---|--------------------|--|----------------|
| 1 | By February | Bhasa's dramas | CO 6 |
| 2 | | Khandakavyas in Sanskrit | CO 4,8 |

References

- 1.Meghadhoota of Kalidasa (Poorva-Megha; 1-20 Slokas)
- 2.Mrichakatika-kathasamgraha, (Chapters 1, 2&3), by Prof. P.C. Vasudevan Elayat
- 3.Siddharupam, Vidyarambham Press, Alappuzha
- 4.Sabdamanjari, Chowkhamba Sanskrit Series office, Varanasi
- 5.Dhaturupamanjari, Chowkhamba Sanskrit Series office, Varanasi
- 6.Sanskritavyakaranapravesika, Pandit L Anantharama Sastri
- 7.Balabodhini, Rajarshi Sree Rama Varma, Publication Divison, Govt.Sanskrit College, Trippunittura

COURSE PLAN- 2019-20

| | | | |
|---------------------|--|-----------|----|
| PROGRAMME | B.Sc CHEMISTRY | SEMESTER | 2 |
| COURSE CODE & TITLE | 19U1CCMAL1A കവിത | CREDITS | 4 |
| HOURS/WEEK | 4 | HOURS/SEM | 72 |
| FACULTY NAME | VISHNU RAJ P, Dr. JUSTINA K AUGUSTINE | | |

| CO No | COURSE OUTCOMES | CL | PSO | PO |
|-------|---|----|-----|-------|
| 1 | കവിത എന്ന സാഹിത്യരൂപത്തെക്കുറിച്ച് മെച്ചപ്പെട്ട ധാരണ ഉണ്ടാക്കുക | Un | 2 | 1,3 |
| 2 | ഭാഷാപഠനം സാഹിത്യാനുഭവത്തിലൂടെ ആവിഷ്കരിക്കുക | Re | 2 | 2,3 |
| 3 | വായനാഭിരുചി വർദ്ധിപ്പിക്കുക | Ap | 2 | 3,4 |
| 4 | സാഹിത്യ പരിചയം ഉണ്ടാക്കുക | Un | 2 | 1,2,3 |
| 5 | വ്യാവഹാരിക തലത്തിൽ മാതൃഭാഷാപ്രയോഗിക്കുവാനുള്ള കഴിവ് നേടുക | Ap | 2 | 1,3,5 |
| 6 | ഭാഷാപഠനത്തിലൂടെ ആശയവിനിമയശേഷി വർദ്ധിപ്പിക്കുക | Cr | 2 | 1,2,6 |

| | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PSO 1 | PSO 2 | PSO 3 | PSO 4 |
|------|------|------|------|------|------|------|-------|-------|-------|-------|
| CO 1 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 3 | 0 | 0 |
| CO 2 | 0 | 3 | 2 | 0 | 0 | 0 | 0 | 3 | 0 | 0 |
| CO 3 | 1 | 2 | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 0 |
| CO 4 | 2 | 1 | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 0 |
| CO5 | 1 | 0 | 2 | 0 | 1 | 0 | 0 | 2 | 0 | 0 |
| CO6 | 2 | 2 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 0 |

Mapping Strength: 0-No Mapping strength, 1- Low, 2-Medium, 3-High

COURSE PLAN

| Session | Topic | Learning Resources | Teaching Method | Course Outcome |
|-----------------|------------------------------|--------------------|------------------|----------------|
| Module I | | | | |
| 1 | മലയാളസാഹിത്യം സാമാന്യാവലോകനം | സാഹിത്യചരിത്രങ്ങൾ | Lecturing | 1,2,3,4 |
| 2 | മലയാളകവിതയുടെ ചരിത്രം-1 | സാഹിത്യചരിത്രങ്ങൾ | Lecturing | 1,2,3,4 |
| 3 | മലയാളകവിതയുടെ ചരിത്രം-2 | സാഹിത്യചരിത്രങ്ങൾ | Discussion | 1,2,3,4,6 |
| 4 | ചങ്ങമ്പുഴയുടെ രചനാലോകം | കവിതാപഠനങ്ങൾ | Lecturing | 2,3,4 |
| 5 | മനസിനി | Text | Reading | 1,2,3,4,5,6 |
| 6 | മനസിനി | Text | Group Discussion | 1,2,3,4,5,6 |
| 7 | സൂര്യകാന്തി | കവിതാപഠനങ്ങൾ | Lecturing | 2,3,4 |
| 8 | സൂര്യകാന്തി | Text | Reading | 1,2,3,4,5,6 |
| 9 | ഗോപികാദണ്ഡകം | Text | Group Discussion | 1,2,3,4,5,6 |
| 10 | ഗോപികാദണ്ഡകം | കവിതാപഠനങ്ങൾ | Lecturing | 2,3,4 |
| 11 | ഗോപികാദണ്ഡകം | Text | Reading | 1,2,3,4,5,6 |
| 12 | വിരാമം | Text | Group Discussion | 1,2,3,4,5,6 |
| 13 | വിരാമം | കവിതാപഠനങ്ങൾ | Lecturing | 2,3,4 |
| 14 | വിരാമം | Text | Reading | 1,2,3,4,5,6 |
| 15 | പുതിയമാഷ്വാർ | Text | Group Discussion | 1,2,3,4,5,6 |
| 16 | പുതിയമാഷ്വാർ | Text | Group Discussion | 1,2,3,4,5,6 |

| | | | | |
|-------------------|---|---------------|------------------|-------------|
| 17 | പഠിച്ച കവിതകൾ ഒരു അവലോകനം | Text | Group Discussion | 1,2,3,4 |
| Module II | | | | |
| 18 | ആധുനിക മലയാളകവിതയുടെ സ്വഭാവങ്ങൾ | കവിതാ പഠനങ്ങൾ | Lecturing | 2,3,4 |
| 19 | യുഗളപ്രസാദൻ | Text | Reading | 1,2,3,4,5,6 |
| 20 | യുഗളപ്രസാദൻ | Text | Group Discussion | 1,2,3,4,5,6 |
| 21 | ആത്മഹത്യ ചെയ്ത കർഷകൻ വെള്ളത്തെക്കുറിച്ച് സംസാരിക്കുന്നു | Text | Lecturing | 2,3,4 |
| 22 | ആത്മഹത്യ ചെയ്ത കർഷകൻ വെള്ളത്തെക്കുറിച്ച് സംസാരിക്കുന്നു | Text | Reading | 1,2,3,4,5,6 |
| 23 | ആത്മഹത്യ ചെയ്ത കർഷകൻ വെള്ളത്തെക്കുറിച്ച് സംസാരിക്കുന്നു | Text | Group Discussion | 1,2,3,4,5,6 |
| 24 | കളുകൾ | കവിതാ പഠനങ്ങൾ | Lecturing | 2,3,4 |
| 25 | കളുകൾ | Text | Reading | 1,2,3,4,5,6 |
| 26 | പറക്കം | Text | Group Discussion | 1,2,3,4,5,6 |
| 27 | പറക്കം | കവിതാ പഠനങ്ങൾ | Lecturing | 2,3,4 |
| 28 | കീരി | Text | Reading | 1,2,3,4,5,6 |
| 29 | കീരി | Text | Group Discussion | 1,2,3,4,5,6 |
| 30 | പഠിച്ച കവിതകൾ ഒരു അവലോകനം | Text | Group Discussion | 1,2,3,4 |
| 31 | Internal Assessment 1 | Text | | |
| 32 | Question paper discussion | Text | Group Discussion | 1,2,3,4,5,6 |
| Module III | | | | |
| 33 | മലയാള - നൂതന പ്രവണതകൾ | കവിതാ പഠനങ്ങൾ | Lecturing | 2,3,4 |
| 34 | കാക്ക | Text | Reading | 1,2,3,4,5,6 |
| 35 | കാക്ക | Text | Group Discussion | 1,2,3,4,5,6 |
| 36 | മോഹൻദാസും ഗാന്ധിയും നാമുറാം ഗോഡ്സെയും | കവിതാ പഠനങ്ങൾ | Lecturing | 2,3,4 |
| 37 | മോഹൻദാസും ഗാന്ധിയും നാമുറാം ഗോഡ്സെയും | Text | Reading | 1,2,3,4,5,6 |

| | | | | |
|-------------------|---------------------------|---------------|------------------|-------------|
| 38 | നാരാണത്ത് പാറ | Text | Group Discussion | 1,2,3,4,5,6 |
| 39 | നാരാണത്ത് പാറ | കവിതാ പഠനങ്ങൾ | Lecturing | 2,3,4 |
| 40 | യശോധാരയെന്നവൾ | Text | Reading | 1,2,3,4,5,6 |
| 41 | യശോധാരയെന്നവൾ | Text | Group Discussion | 1,2,3,4,5,6 |
| 42 | മാമ്പഴപ്പാത | കവിതാ പഠനങ്ങൾ | Lecturing | 2,3,4 |
| 43 | മാമ്പഴപ്പാത | Text | Reading | 1,2,3,4,5,6 |
| 44 | മാമ്പഴപ്പാത | Text | Group Discussion | 1,2,3,4,5,6 |
| 45 | പഠിച്ച കവിതകൾ ഒരു അവലോകനം | Text | Group Discussion | 1,2,3,4 |
| Module- IV | | | | |
| 46 | മലയാള - നൂതന പ്രവണതകൾ | കവിതാ പഠനങ്ങൾ | Lecturing | 1,2,3,4 |
| 47 | ചിന്താഗ്നി | Text | Group Discussion | 1,2,3,4 |
| 48 | ചിന്താഗ്നി | Text | Lecturing | 1,2,3,4 |
| 49 | ആ പശുകുട്ടിയുടെ മരണം | Text | Group Discussion | 1,2,3,4 |
| 50 | ആ പശുകുട്ടിയുടെ മരണം | കവിതാ പഠനങ്ങൾ | Lecturing | 1,2,3,4 |
| 51 | തേൾക്കുടം | Text | Lecturing | 1,2,3,4 |
| 52 | തേൾക്കുടം | Text | Group Discussion | 1,2,3,4,6 |
| 53 | കൗസല്യ | Text | Group Discussion | 1,2,3,4,6 |
| 54 | കൗസല്യ | Text | Group Discussion | 1,2,3,4,6 |
| 55 | കൗസല്യ | Text | Group Discussion | 1,2,3,4,6 |
| 56 | എന്തു ശൂന്തി ഏതു ശൂന്തി | Text | Group Discussion | 1,2,3,4,6 |
| 57 | എന്തു ശൂന്തി ഏതു ശൂന്തി | Text | Group Discussion | 1,2,3,4,6 |
| 58 | സമകാലിക മലയാള കവിത | കവിതാ പഠനങ്ങൾ | Group Discussion | 1,2,3,4,6 |
| 59 | സമകാലിക മലയാള കവിത | Text | Group Discussion | 1,2,3,4,6 |
| 60 | സമകാലിക മലയാള കവിത | Text | Group Discussion | 1,2,3,4,6 |
| 61 | പഠിച്ച കവിതകൾ ഒരു അവലോകനം | കവിതാ പഠനങ്ങൾ | Group Discussion | 1,2,3,4,6 |
| 62 | പഠിച്ച കവിതകൾ ഒരു അവലോകനം | Text | Group Discussion | 1,2,3,4,6 |
| | Internal Assessment 2 | | | |
| 63 | Question paper discussion | Text | Group Discussion | 1,2,3,4,6 |
| 64 | പഠിച്ച കവിതകൾ ഒരു | കവിതാ | Group Discussion | 1,2,3,4,6 |

| | | | | |
|----|---------------------------|---------------|------------------|-------------|
| | അവലോകനം | പഠനങ്ങൾ | | |
| 65 | പഠിച്ച കവിതകൾ ഒരു അവലോകനം | കവിതാ പഠനങ്ങൾ | Group Discussion | 1,2,3,4,6 |
| 66 | സംവാദം- | Text | Group Discussion | 1,2,3,4,6 |
| 67 | സെമിനാർ | Text | Presentation | 1,2,3,4,6 |
| 68 | സെമിനാർ | Text | Presentation | 1,2,3,4,6 |
| 69 | സെമിനാർ | Text | Presentation | 1,2,3,4,6 |
| 70 | സെമിനാർ | Text | Presentation | 1,2,3,4,6 |
| 71 | സെമിനാർ | Text | Presentation | 1,2,3,4,6 |
| 72 | Evaluation of the course | Text | Group Discussion | 1,2,3,4,5,6 |

ASSIGNMENTS

| Sl no | Date of submission/completion | Topic of Assignment & Nature of assignment (Individual/Group – Written/Presentation – Graded or Non-graded etc) |
|-------|-------------------------------|---|
| 1 | By February | മലയാളത്തിലെ തെരഞ്ഞെടുത്ത കവികളുടെ വിവരണങ്ങൾ |
| 2 | | സിലബസിൽ പഠിക്കാൻ ഇല്ലാത്ത കവിതകളുടെ ആസ്വാദനം |

SEMINAR

| | Date of submission/completion | Topic of seminar & Nature of seminar (Individual/Group – Written/Presentation – Graded or Non-graded etc) | Weightage |
|---|-------------------------------|---|-----------|
| 1 | By February | പാഠഭാഗങ്ങളുടെ അവതരണം | 1,2,3,4 |
| 2 | | പാഠഭാഗങ്ങളുടെ അവതരണം | 1,2,3,4,5 |

Referance :

1. സമ്പൂർണ്ണ മലയാള സാഹിത്യ ചരിത്രം - എഡിറ്റർ :പത്മന രാമചന്ദ്രൻ നായർ
2. മലയാള കവിതാസാഹിത്യ ചരിത്രം - ഡോ .എം .ലീലാവതി

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

CO -PO/PSO Mapping

| | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PSO 1 | PSO 2 | PSO 3 | PSO 4 | PSO 5 |
|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|
| CO 1 | 2 | | | | | | 2 | | | | |
| CO 2 | 3 | | | | | | 2 | | | | |
| CO 3 | 3 | | | 2 | | | 2 | | | | |
| CO 4 | 2 | | | | | | | | 2 | | |
| CO 5 | | | | 2 | | | | | | | |

Mapping Strength

0. No Mapping strength
1. Low
2. Medium
3. High

| 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 applications | Conventional Teaching | | CO 1 |
| 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's rules and its applications. | Conventional Teaching | | CO 2 |
| 8 | <i>Covalent Bond</i> : Lewis theory. Valence Bond Theory. Coordinate 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_2H_2), sp^2 (BF_3 , C_2H_4), sp^3 (CH_4 , CCl_4 , NH_3 , H_2O , NH_4^+ , H_3O^+ and SO_4^{2-}) | Conventional Teaching | quiz | CO 2 |
| 11 | sp^3d (PCl_5), sp^3d^2 (SF_6) and sp^3d^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 – | Conventional Teaching | | CO 2 |

| | | | | |
|---|---|---|---------------|------|
| | Percentage of ionic character –Dipole moment and molecular structure. | | | |
| 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 nuclear systems | Conventional Teaching | quiz | CO 3 |
| 16 | MO diagram of heteronuclear system <ul style="list-style-type: none"> ➤ CO and NO ➤ Magnetic behaviour pf these homo nuclear systems ➤ Comparison of bond length, magnetic behaviour and bond energy of O₂, O₂⁺, O₂²⁺, O₂⁻ and O₂²⁻ | 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 ➤ Nuclear particles, nuclear forces, nuclear size, nuclear density | Conventional Teaching | | CO 4 |
| 24 | Stability of nucleus ➤ binding energy ➤ magic numbers ➤ packing fraction ➤ n/p ratio. Nuclear Models | Conventional Teaching | | CO 4 |
| 25 | Natural Radioactivity ➤ modes of decay, decay constant ➤ half-life period, average life | Conventional Teaching | | CO 4 |
| 26 | Radioactive Equilibrium Geiger-Nuttal 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/ACTIVITES – 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

CO -PO/PSO Mapping

| | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PSO 1 | PSO 2 | PSO 3 | PSO 4 | PSO 5 |
|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|
| CO 1 | 2 | | | | | | 1 | | | | |
| CO 2 | 3 | | | | | | 2 | | | | |
| CO 3 | 3 | | | | | | 1 | | | | |
| CO 4 | 2 | | | | | | 2 | | | | |

Mapping Strength

- 0- No Mapping strength
- 1- Low
- 2- Medium
- 3- High

| SESSIO | TOPIC | LEARNING | VALUE | COURSE |
|--------|-------|----------|-------|--------|
|--------|-------|----------|-------|--------|

| N | | RESOURCES | ADDITIONS | 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 | | CO 3 |

| | | | | |
|----|---|----------|--|------|
| | | Activity | | |
| 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

CO -PO/PSO Mapping

| | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PSO 1 | PSO 2 | PSO 3 | PSO 4 | PSO 5 |
|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|
| CO 1 | | | | | | | | 3 | | | |
| CO 2 | | | | | | | | 2 | | | |
| CO 3 | | | | | | | | 2 | | | |
| CO 4 | 2 | | | | | | | 2 | | 3 | |
| CO 5 | 2 | | | | | | | 1 | | | |
| CO 6 | 2 | | | | | | | 2 | | | |

Mapping Strength

- 0- No Mapping strength
- 1- Low
- 2- Medium
- 3- High

| 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 Discussion, Problem Solving | Q & A Session | CO 1 |
| 7 | The Definite integral. | Lecture, Group Discussion, Problem Solving | | CO 1 |
| 8 | Fundamental theorem of Calculus | Lecture, Group Discussion, Problem Solving | | CO 1 |
| 9 | Fundamental theorem of | Lecture, Group | | CO 1 |

| | | | | |
|----|---|------------------------------|---------------|-----------------------|
| | Calculus | Discussion, Problem Solving | | |
| 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 rotation about an axis (disc method only) | Lecture, Discussion, Solving | Group Problem | CO 2 |
| 21 | Volumes by slicing and rotation about an axis (disc method only) | Lecture, Discussion, Solving | Group Problem | Quiz CO 2 |
| 22 | Areas of surfaces of revolution and the theorem of Pappus (excluding theorem of Pappus) | Lecture, Discussion, Solving | Group Problem | CO 2 |

| | | | | | |
|----|---|------------------------------|---------------|---------------|------|
| 23 | Areas of surfaces of revolution and the theorem of Pappus (excluding theorem of Pappus) | Lecture, Discussion, Solving | Group Problem | | CO 2 |
| 24 | Areas of surfaces of revolution and the theorem of Pappus (excluding theorem of Pappus) | Lecture, Discussion, Solving | Group Problem | Q & A Session | CO 2 |
| 25 | Areas of surfaces of revolution and the theorem of Pappus (excluding theorem of Pappus) | Lecture, Discussion, Solving | Group Problem | | CO 2 |
| 26 | Double Integrals | Lecture, Discussion, Solving | Group Problem | | CO 3 |
| 27 | Double Integrals | Lecture, Discussion, Solving | Group Problem | Quiz | CO 3 |
| 28 | Area of bounded region in plane only | Lecture, Discussion, Solving | Group Problem | | CO 3 |
| 29 | Area of bounded region in plane only | Lecture, Discussion, Solving | Group Problem | | CO 3 |
| 30 | Area of bounded region in plane only | Lecture, Discussion, Solving | Group Problem | | CO 3 |
| 31 | Area of bounded region in plane only | Lecture, Discussion, Solving | Group Problem | | 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, | Group Problem | | CO 4 |

| | | | | |
|----|--|------------------------------|---------------|-----------------------|
| | | Solving | | |
| 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, Solving | Group Problem | CO 5 |
| 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 |

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|----|--|------------------------------|---------------|--|------|
| 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) | Course 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) | Course Outcome |
|---|--------------------|---|----------------|
| 1 | 2/2/2019 | PROBLEMS IN MULTIPLE INTEGRATION | CO 3, CO 4 |

REFERENCES

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- 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)