

K.M.G. COLLEGE OF ARTS & SCIENCE, GUDIYATTAM.
P.G. & RESEARCH DEPARTMENT OF CHEMISTRY
Programme Name : M.Sc., CHEMISTRY

| <u>S.No</u> | <u>OUTCOMES</u> |
|-------------|--|
| PO1 | Domain knowledge: Demonstrate knowledge of basic concepts, principles and applications of the specific science discipline. |
| PO2 | Resource Utilisation: Cultivate the skills to acquire and use appropriate learning resources including library, e |
| PO3 | Analytical and Technical Skills: Ability to handle/use appropriate tools/techniques/equipment with an understanding of the standard operating procedures, safety aspects/limitations. |
| PO4 | Critical thinking and Problem solving: Identify and critically analyse pertinent problems in the relevant discipline using appropriate tools and techniques as well as approaches to arrive at viable conclusions/solutions. |
| PO5 | Project Management: Demonstrate knowledge and scientific understanding to identify research problems, design experiments, use appropriate methodologies, analyse and interpret data and provide solutions. Exhibit organisational skills and the ability to manage time and resources. |
| PO6 | Individual and team work: Exhibit the potential to effectively accomplish tasks independently and as a member or leader in diverse teams, and in multidisciplinary settings. |
| PO7 | Effective Communication: Communicate effectively in spoken and written form as well as through electronic media with the scientific community as well as with society at large. Demonstrate the ability to write dissertations, reports, make effective presentations and documentation. |
| PO8 | Environment and Society: Analyse the impact of scientific and technological advances on the environment and society and the need for sustainable development. |
| PO9 | Ethics: Commitment to professional ethics and responsibilities. |
| PO10 | Life-long learning: Ability to engage in life-long learning in the context of the rapid developments in the discipline. |

Program specific Outcomes:

| <u>S.No</u> | <u>OUTCOMES</u> |
|--------------------|--|
| PSO-1 | Apply principles of pharmaceutical chemistry, medicinal chemistry, analytical chemistry, organometallic chemistry, supramolecular chemistry, chemical process and laboratory skills for volumetric analysis, synthesis, separation, isolation and formulation. |
| PSO-2 | Work with professional ethics in quality control and quality assurance sections of R&D sectors of different research laboratories |
| PSO-3 | Apply knowledge of chemistry to excel in higher studies and field of research. |
| PSO-4 | Application of research skills to pursue doctoral programme. |
| PSO-5 | To be in a noble profession of teaching and helping in nation building. |

SEMESTER I

Sub.Name: ORGANIC CHEMISTRY-I

No.of Hours per week:4

Sub.Code:DCH11

Course Outcomes

| Semester | Course Name | Course Credit | Course Outcomes |
|--|---------------------|---------------|---|
| M.Sc – I YEAR SEMESTER-1 (REGULATION: 2020-2021) | ORGANIC CHEMISTRY-I | 04 | CO1-The student will be able to Describe the concept of Stereochemistry CO2-Illustrate the importance of Conformation CO3-Analyze the mechanism of Aliphatic and Aromatic Substitution reactions CO4-cquire knowledge on the various concepts of reaction kinetics and mechanism CO5-To make the students learn and understand the concept of stereochemistry, conformational analysis and their application in the determination of reaction mechanism. CO6-To understand the mechanism of nucleophilic and electrophilic substitution reactions. |

ORGANIC CHEMISTRY-I

| Cos | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| CO1 | M | S | S | S | M | M | S | S | S | M |
| CO2 | S | M | M | S | M | S | S | M | S | M |
| CO3 | S | M | S | S | S | M | M | S | S | S |
| CO4 | M | M | S | S | M | S | S | S | S | M |
| CO5 | M | S | M | M | S | M | S | M | M | S |
| CO6 | S | M | S | S | S | M | M | S | S | S |

SEMESTER I

Sub.Name: INORGANIC CHEMISTRY-I

No.of Hours per week:4

Sub.Code:DCH12

| Semester | Course Name | Course Credit | Course Outcomes |
|---|-----------------------|---------------|--|
| M.Sc – I YEAR SEMESTER-1 (REGULATION: 2020-2021) | INORGANIC CHEMISTRY-I | 03 | CO1-Gain knowledge about the structure and bonding of Inorganic compounds. CO2-Explain Isopolyacids and heteropolyacids of Vanadium, Chromium, Molybdenum and Tungsten. CO3-Describe the structure, properties, correlation and applications of some Inorganic CO4-Polymers. Illustrates the chemistry of metal clusters. CO5-Discuss polyhedral boranes, carboranes and metallocarboranes. CO6-Explain the stability constant of coordination complexes. CO7-Apply the stereo chemistry for coordination complexes. |

INORGANIC CHEMISTRY-I

| Cos | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| CO1 | S | S | S | S | M | M | S | M | M | M |
| CO2 | S | M | M | S | M | S | S | S | M | S |
| CO3 | S | M | S | S | S | M | M | S | S | M |
| CO4 | S | M | S | S | M | S | S | M | M | S |
| CO5 | M | S | M | M | S | M | S | M | S | M |
| CO6 | S | M | S | S | S | M | M | S | S | M |
| CO7 | S | M | S | S | M | S | S | M | M | S |

SEMESTER I

Sub.Name: PHYSICAL CHEMISTRY-I

No.of Hours per week:4

Sub.Code:DCH13

| Semester | Course Name | Course Credit | Course Outcomes |
|---|--------------------------|---------------|--|
| M.Sc – I YEAR SEMESTER-1 (REGULATION: 2020-2021) | PHYSICAL CHEMISTRY -I | 03 | CO1-Explain partial molar properties and the concept of fugacity. CO2-Describe the phase diagrams of three component systems involving solid-liquid CO3-Describe the phase diagrams of three component systems involving liquid-liquid equilibria CO4-Gain the knowledge about micelles, surfactants, structure and stability of colloids. CO5-Illustrate the effect of pressure CO6- dielectric constant and ionic strength of the solution on the rate of the reaction. |

PHYSICAL CHEMISTRY –I

| Cos | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| CO1 | M | S | S | S | M | M | S | S | M | M |
| CO2 | S | M | M | S | M | S | S | M | S | S |
| CO3 | S | M | S | M | S | M | M | M | S | M |
| CO4 | M | M | S | S | M | S | S | S | M | S |
| CO5 | M | S | M | M | S | M | S | M | S | M |
| CO6 | S | M | S | M | S | M | M | M | S | M |

SEMESTER I

Sub.Name: ADVANCE POLYMER CHEMISTRY

No.of Hours per week:3

Sub.Code:DECH14A

| Semester | Course Name | Course Credit | Course Outcomes |
|---|---------------------------------|---------------|--|
| M.Sc – I YEAR SEMESTER-1 (REGULATION: 2020-2021) | ADVANCE POLYMER CHEMISTRY | 03 | CO1-Understand the morphology and applications of polymers. CO2-Have the knowledge on classification, nomenclature and properties of polymers. CO3-Adequate knowledge on kinetics and mechanism of polymerisation. CO4-Understanding on characterization of polymers. |

ADVANCE POLYMER CHEMISTRY:

| Cos | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| CO1 | M | S | S | S | M | M | S | S | M | S |
| CO2 | S | M | M | S | M | S | S | M | S | S |
| CO3 | S | M | S | S | S | M | M | S | M | M |
| CO4 | M | M | S | S | M | S | S | S | S | S |

SEMESTER II

Sub.Name: ORGANIC CHEMISTRY-II

No.of Hours per week:4

Sub.Code:DCH 21

Course Outcomes

| Semester | Course Name | Course Credit | Course Outcomes |
|---|-------------------------|---------------|---|
| M.Sc – I YEAR SEMESTER-2 (REGULATION: 2020-2021) | ORGANIC CHEMISTRY-II | 03 | CO1-Elucidate the mechanism of addition and elimination reactions CO2-Appreciate the synthetic usage of various oxidizing and reducing reagents CO3-Illustrate the importance of free radicals CO4-Describe the concept of aromaticity |

ORGANIC CHEMISTRY-I

| Cos | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| CO1 | M | S | S | S | M | M | S | S | M | S |
| CO2 | S | M | M | S | M | S | S | M | S | M |
| CO3 | S | M | S | S | S | M | M | S | S | S |
| CO4 | M | M | S | S | M | S | S | S | M | S |

SEMESTER II

Sub.Name: INORGANIC CHEMISTRY-II

No.of Hours per week:4

Sub.Code:DCH 22

Course Outcomes

| Semester | Course Name | Course Credit | Course Outcomes |
|---|---------------------------|---------------|---|
| M.Sc – I YEAR SEMESTER-2 (REGULATION: 2020-2021) | INORGANIC CHEMISTRY-II | 04 | CO1-Explain about the structure and properties of solids. CO2-Describe the types of Nuclear reactions. CO3-Explain about the stellar energy. CO4-Discuss the types of Nuclear reactors. CO5-Illustrate the radio analytical methods CO6-Describe the chemistry of lanthanides and actinides. CO7-Applying Nanotechnology to various metals. |

INORGANIC CHEMISTRY-II

| Cos | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| CO1 | M | S | S | S | M | M | S | M | S | M |
| CO2 | S | M | M | S | M | S | S | S | M | S |
| CO3 | S | M | S | S | S | M | M | S | M | M |
| CO4 | M | M | S | S | M | S | S | M | M | S |
| CO5 | M | S | M | M | S | M | S | M | S | M |
| CO6 | S | M | M | S | M | S | S | S | M | S |
| CO7 | S | M | S | S | S | M | M | S | M | M |

SEMESTER II

Sub.Name: PHYSICAL CHEMISTRY-II

No.of Hours per week:4

Sub.Code:DCH 23

Course Outcomes

| Semester | Course Name | Course Credit | Course Outcomes |
|---|---------------------------|---------------|---|
| M.Sc – I YEAR SEMESTER-2 (REGULATION: 2020-2021) | PHYSICAL CHEMISTRY -II | 03 | CO1-Describe the rate expression for complex reactions and experimental study of fast reactions. CO2-Describe Debeye-Huckel limiting law and Bronsted equation. □ CO3-Explain the structures of double layer and deriving Lippmann equation. CO4-Apply group theory and finding the symmetries and point group to construct CO5-character tables of C _{2v} and C _{3v} . |

PHYSICAL CHEMISTRY –II

| Cos | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| CO1 | M | S | S | S | M | M | S | M | M | M |
| CO2 | S | M | M | S | M | S | S | S | S | S |
| CO3 | S | M | S | S | S | M | M | M | S | M |
| CO4 | M | M | S | S | M | S | S | S | M | S |
| CO5 | M | S | M | M | S | M | S | M | S | M |

SEMESTER II

Sub.Name: MODERN SEPARATION TECHNIQUES

No.of Hours per week:3

Sub.Code:DECH 24A

Course Outcomes

| Semester | Course Name | Course Credit | Course Outcomes |
|---|------------------------------|---------------|--|
| M.Sc – I YEAR SEMESTER-2 (REGULATION: 2020-2021) | MODERN SEPARATION TECHNIQUES | 03 | CO1-Have knowledge on principles on chromatography. CO2-Working knowledge on gas and HPCL chromatographic techniques. CO3-Adequate knowledge on application of ion-exchange chromatography.\ CO4-Understanding on solvent extraction CO5- Understanding on distillation techniques |

MODERN SEPARATION TECHNIQUES:

| Cos | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| CO1 | M | S | S | S | M | M | S | M | M | S |
| CO2 | S | M | M | S | M | S | S | M | S | S |
| CO3 | S | M | S | S | S | M | M | S | M | S |
| CO4 | M | M | S | S | M | S | S | M | S | S |
| CO5 | M | S | M | M | S | M | S | S | M | M |

SEMESTER II

Sub.Name: ORGANIC CHEMISTRY-PRACTICAL-I

No.of Hours per week:4

Sub.Code:DPCH 26

Course Outcomes

| Semester | Course Name | Course Credit | Course Outcomes |
|---|--------------------------------------|---------------|--|
| M.Sc – I YEAR SEMESTER-2 (REGULATION: 2020-2021) | ORGANIC CHEMISTRY- PRACTICAL-I | 03 | CO1-An ability to separate the mixture of organic compounds CO2-An ability to analyse the compounds separated from the mixture by chemical analysis CO3-Ability to find out the melting and boiling points of the compounds CO4- Ability to prepare organic compounds by two or three steps |

ORGANIC CHEMISTRY-PRACTICAL I

| Cos | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| CO1 | M | S | S | S | M | M | S | M | S | S |
| CO2 | S | M | M | S | M | S | S | S | M | M |
| CO3 | S | M | S | S | S | M | M | S | M | S |
| CO4 | M | M | S | S | M | S | S | M | M | S |

SEMESTER II

Sub.Name: INORGANIC CHEMISTRY-PRACTICAL-I

No.of Hours per week:4

Sub.Code:DPCH 27

Course Outcomes

| Semester | Course Name | Course Credit | Course Outcomes |
|---|--------------------------------|---------------|--|
| M.Sc – I YEAR SEMESTER-2 (REGULATION: 2020-2021) | INORGANIC CHEMISTRY-PRACTICAL1 | 03 | CO1-Use double burette method and burette –pipette methods for titration CO2 -Prepare standard solutions CO3-Conduct acid base titrations, complexometric titrations and redox titrations like permanganometry, dichrometry and iodometric-iodimetric titrations. CO4-An ability to analyse the cation mixture CO5-Ability to estimate the ions by complexometric titrations CO6-Ability to find out intensity of colour using colorimetric methods |

INORGANIC CHEMISTRY- PRACTICAL-1

| Cos | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| CO1 | M | S | S | S | M | M | S | S | M | M |
| CO2 | S | M | M | S | M | S | S | M | S | S |
| CO3 | S | M | S | S | S | M | M | M | S | M |
| CO4 | M | M | S | S | M | S | S | M | S | S |
| CO5 | M | S | M | M | S | M | S | S | S | M |
| CO6 | M | M | S | S | M | S | S | M | S | S |

SEMESTER II

Sub.Name: PHYSICAL CHEMISTRY- PRACTICAL1

No.of Hours per week:4

Sub.Code:DPCH 27

Course Outcomes

| Semester | Course Name | Course Credit | Course Outcomes |
|--|--------------------------------|---------------|--|
| M.Sc – I YEAR SEMESTER-2 (REGULATION: 2020-2021) | PHYSICAL CHEMISTRY- PRACTICAL1 | 03 | <p>CO1- Explain the Thermodynamics of ideal and Non-ideal solutions, Nernst distribution law and its applications.</p> <p>CO2- Draw and explain phase diagrams of one Component and two Component systems having congruent and incongruent melting points.</p> <p>CO3- Derive law of Chemical equilibrium and Van't Hoff isotherm.</p> <p>CO4- Determine molar mass from the colligative properties.</p> <p>CO5- Explain variation of conductivity with dilution, measurement of conductivity and concept of Transport Number and its determination.</p> <p>CO6- Explain Debye-Huckel Theory of strong electrolytes.</p> |

PHYSICAL CHEMISTRY- PRACTICAL -I

| Cos | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| CO1 | M | S | S | S | M | M | S | S | M | M |
| CO2 | S | M | M | S | M | S | S | M | S | S |
| CO3 | S | M | S | S | S | M | M | M | M | S |
| CO4 | M | M | S | S | M | S | S | S | S | M |
| CO5 | M | S | M | M | S | M | S | S | M | M |
| CO6 | M | S | S | S | M | M | S | S | M | M |

SEMESTER II

Sub.Name: MEDICINAL CHEMISTRY

No.of Hours per week:4

Sub.Code: DNCH28A

Course Outcomes

| Semester | Course Name | Course Credit | Course Outcomes |
|---|------------------------|---------------|---|
| M.Sc – I YEAR SEMESTER-2 (REGULATION: 2020-2021) | MEDICINAL CHEMISTRY | 03 | CO1- The students will be able to Appreciate CO2- the importance of medicinal chemistry CO3- Acquire knowledge of classification of drugs CO4-Identify the importance of Chemotherapy CO5- Acquire knowledge of common body ailments Illustrte the importance of health promoting drugs |

MEDICINAL CHEMISTRY

| Cos | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| CO1 | M | S | S | S | M | M | S | M | M | M |
| CO2 | S | M | M | S | M | S | S | S | S | S |
| CO3 | S | M | S | S | S | M | M | S | M | M |
| CO4 | M | M | S | S | M | S | S | M | S | S |
| CO5 | M | S | M | M | S | M | S | M | M | M |

SEMESTER III

Sub.Name: ORGANIC CHEMISTRY-III

No.of Hours per week:4

Sub.Code:DCH31

Course Outcomes

| Semester | Course Name | Course Credit | Course Outcomes |
|--|-----------------------|---------------|---|
| M.Sc – II YEAR SEMESTER-3 (REGULATION: 2020-2021) | ORGANIC CHEMISTRY-III | 04 | CO1- To understand the concepts of spectral techniques and to apply these techniques for the quantitative and structural analysis of organic compounds. CO2-To learn the chemistry of terpenes, alkaloids and free radicals and their importance. CO3-Visualize the importance of UV-Visible and IR spectroscopy. CO4-Acquire knowledge of vibrational transition and identify various functional groups CO5-Apply the concept of Mass spectroscopy to different compounds CO6-Elucidate the structure of organic compounds using NMR CO7-Solve photochemical and pericyclic problems CO8-Illustrate the synthesis of heterocycles |

ORGANIC CHEMISTRY-III

| Cos | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| CO1 | M | S | S | S | M | M | S | M | M | S |
| CO2 | S | M | M | S | M | S | S | M | S | S |
| CO3 | S | M | S | S | S | M | M | S | M | M |
| CO4 | M | M | S | S | M | S | S | M | S | S |
| CO5 | M | S | M | M | S | M | S | S | M | S |
| CO6 | S | M | M | S | M | S | S | M | S | M |
| CO7 | S | M | S | S | S | M | M | S | S | S |
| CO8 | M | M | S | S | M | S | S | S | S | M |

SEMESTER III

Sub.Name: INORGANIC CHEMISTRY-III

No.of Hours per week:4

Sub.Code:DCH32

Course Outcomes

| Semester | Course Name | Course Credit | Course Outcomes |
|--|----------------------------|---------------|--|
| M.Sc – II YEAR SEMESTER-3 (REGULATION: 2020-2021) | INORGANIC CHEMISTRY-III | 04 | <p>CO1-To study about the Coordination complexes, Substitution in Coordination complexes and Inorganic Photochemistry.</p> <p>CO2-Explain about carbon donors</p> <p>CO3-Describe the structure and bonding of metallocenes (ferrocenes)</p> <p>CO4-Illustrate the different types of reaction of organo metallic compounds.</p> <p>CO5-Discuss the various catalysis processes in organo metallic chemistry.</p> <p>CO6-Explain the Electron transfer reactions of coordination compounds.</p> <p>CO7-Describe the various substitution reactions of coordination compounds.</p> <p>CO8-Analyse various types of photochemical reactions.</p> |

ORGANIC CHEMISTRY-III

| Cos | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| CO1 | M | S | S | S | M | M | S | M | M | S |
| CO2 | S | M | M | S | M | S | S | M | S | S |
| CO3 | S | M | S | S | S | M | M | S | M | M |
| CO4 | M | M | S | S | M | S | S | M | S | S |
| CO5 | S | M | S | S | S | M | M | S | M | M |
| CO6 | M | M | S | S | M | S | S | M | S | S |
| CO7 | M | S | M | M | S | M | S | S | M | S |
| CO8 | S | M | M | S | M | S | S | M | S | M |

SEMESTER III

Sub.Name: PHYSICAL CHEMISTRY III

No.of Hours per week:4

Sub.Code:DCH33

Course Outcomes

| Semester | Course Name | Course Credit | Course Outcomes |
|--|---------------------------|---------------|---|
| M.Sc – II YEAR SEMESTER-3 (REGULATION: 2020-2021) | PHYSICAL CHEMISTRY III | 04 | CO1-To study the electrochemical kinetics, over potential, corrossions and fuel cells. CO2-To know the solid state and its properties. To Study the principles and applications of spectroscopy. CO3-To study statistical thermodynamics, CO4-Derive Butler-Volmer equation and explain Pourbaix and Evan’s diagram of corrosion. CO5-Explain electrical and magnetic properties of solids. CO6-Describe the basic principles and applications of microwace, vibrational, Raman, NMR and electronic spectroscopy. CO7-Compare Maxwell-Boltzmann and Fermi-Dirac and Bose-Einstein statistics. |

PHYSICAL CHEMISTRY III

| CO/POs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| CO1 | M | S | M | M | S | S | M | S | M | M |
| CO2 | S | M | S | M | M | S | M | M | S | S |
| CO3 | M | M | S | S | S | M | S | M | S | M |
| CO4 | S | S | M | S | S | S | S | S | M | M |
| CO5 | S | M | S | M | M | S | M | S | M | S |
| CO6 | S | S | M | S | S | M | S | M | S | M |
| CO7 | M | S | S | M | M | S | S | S | M | S |

SEMESTER III

Sub.Name: SCIENTIFIC RESEARCH METHODOLOGY No.of Hours per week:3

Sub.Code: DECH34A

Course Outcomes

| Semester | Course Name | Course Credit | Course Outcomes |
|--|---------------------------------------|---------------|--|
| M.Sc – II YEAR SEMESTER-3 (REGULATION: 2020-2021) | SCIENTIFIC RESEARCH METHODOLOGY | 03 | CO1-To study about the importance of research, CO2- To study about literature survey CO3-To study about statistical treatment. CO4-To study about the conventions of writing thesis. CO5- To study about error analysis. |

SCIENTIFIC RESEARCH METHODOLOGY

| CO/POs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| CO1 | M | S | M | M | S | S | M | S | M | M |
| CO2 | S | M | S | M | M | S | M | M | S | S |
| CO3 | M | M | S | S | S | M | S | M | S | M |
| CO4 | S | S | M | S | S | S | S | S | M | M |
| CO5 | S | M | S | M | M | S | M | S | M | S |

SEMESTER IV

Sub.Name: ORGANIC CHEMISTRY-IV

No.of Hours per week:4

Sub.Code: DCH 41

Course Outcomes

| Semester | Course Name | Course Credit | Course Outcomes |
|---|-------------------------|---------------|---|
| M.Sc – II YEAR SEMESTER-4 (REGULATION: 2020-2021)) | ORGANIC CHEMISTRY-IV | 04 | CO1-To understand the concepts of Aromaticity, Photochemical Reactions, Antibiotics and proteins. Applications and Techniques of Dyeing CO2-Develop problem solving skills requiring application of chemical reaction. CO3-Acquire knowledge of terpenes and alkaloids. CO4-Elucidate the structure of proteins and nucleic acids. CO5-Solve problems related to molecular rearrangements CO6-Attain skills on separation and purification of organic compounds. |

ORGANIC CHEMISTRY-IV

| CO/POs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| CO1 | M | S | M | M | S | S | M | S | M | M |
| CO2 | S | M | S | M | M | S | M | M | S | S |
| CO3 | M | M | S | S | S | M | S | M | S | M |
| CO4 | S | S | M | S | S | S | S | S | M | M |
| CO5 | S | M | S | M | M | S | M | S | M | S |
| CO6 | S | S | M | S | S | M | S | M | S | M |

SEMESTER IV

Sub.Name: INORGANIC CHEMISTRY-IV

No.of Hours per week:4

Sub.Code: DECH 43A

Course Outcomes

| Semester | Course Name | Course Credit | Course Outcomes |
|--|---------------------------|---------------|---|
| M.Sc – II YEAR SEMESTER-4 (REGULATION: 2020-2021) | INORGANIC CHEMISTRY-IV | 04 | CO1- Illustrate the principle, instrumentation and applications of AAS, AES and AFS. CO2-Explain the different types of inorganic spectra and also interpretation. CO3-Applying and interpreting ESR spectrums of various inorganic compounds. CO4-Describe Koopman's theorem, structure, chemical shift. CO5-correlation with electronic charges of photo electron spectroscopy. |

INORGANIC CHEMISTRY-IV

| CO/POs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| CO1 | M | S | M | M | S | S | M | S | M | M |
| CO2 | S | M | S | M | M | S | M | M | S | S |
| CO3 | M | M | S | S | S | M | S | M | S | M |
| CO4 | S | S | M | S | S | S | S | S | M | M |
| CO5 | S | M | S | M | M | S | M | S | M | S |
| CO6 | S | S | M | S | S | M | S | M | S | M |

SEMESTER IV

Sub.Name: PHYSICAL CHEMISTRY IV

No.of Hours per week:4

Sub.Code: DCH 42

Course Outcomes

| Semester | Course Name | Course Credit | Course Outcomes |
|--|-----------------------------|---------------|--|
| M.Sc – II YEAR SEMESTER-4 (REGULATION: 2020-2021) | PHYSICAL CHEMISTRY IV | 04 | CO1-To study the principles of photochemical reactions. CO2-To study the Experimental methods and kinetics studies of photochemical reactions. CO3-Study of electrode - electrolytic interface. CO4-To study the fundamental principles of quantum chemistry and its application to chemical bonding. CO5- Schrödinger wave equation and its applications. CO6-To study statistical thermodynamics, quantum statistics and irreversible thermodynamics. |

PHYSICAL CHEMISTRY IV

| CO/POs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| CO1 | M | S | M | M | S | S | M | S | M | M |
| CO2 | S | M | S | M | M | S | M | M | S | S |
| CO3 | M | M | S | S | S | M | S | M | S | M |
| CO4 | S | S | M | S | S | S | S | S | M | M |
| CO5 | S | M | S | M | M | S | M | S | M | S |
| CO6 | S | S | M | S | S | M | S | M | S | M |

SEMESTER IV

Sub.Name: ORGANIC CHEMISTRY- PRACTICAL-2

No.of Hours per week:4

Sub.Code: DPCH 45

Course Outcomes

| Semester | Course Name | Course Credit | Course Outcomes |
|--|--------------------------------|---------------|---|
| M.Sc – II YEAR SEMESTER-4 (REGULATION: 2020-2021) | ORGANIC CHEMISTRY- PRACTICAL-2 | 03 | CO1-Students can expertise the estimation of reducing sugar, amino group, phenolic group CO2-Students can expertise the estimation of esters volumetrically CO3- Students can expertise the estimation of vitamin A, drugs and anti-biotics colorimetrically CO4-Students will expertise the extraction of natural products and purification by column and TLC CO5-Students can expertise preparation of TLC plate activation and identification of compounds dyes,food additives, food colours, amino acids, sugars, pesticides and herbicides |

ORGANIC CHEMISTRY- PRACTICAL-2

| CO/POs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| CO1 | M | S | M | M | S | S | M | S | M | M |
| CO2 | S | M | S | M | M | S | M | M | S | S |
| CO3 | M | M | S | S | S | M | S | M | S | M |
| CO4 | S | S | M | S | S | S | S | S | M | M |
| CO5 | S | M | S | M | M | S | M | S | M | S |

SEMESTER IV

Sub.Name: ORGANIC CHEMISTRY- PRACTICAL-2

No.of Hours per week:4

Sub.Code: DPCH 46

Course Outcomes

| Semester | Course Name | Course Credit | Course Outcomes |
|---|--|---------------|--|
| M.Sc – II YEAR SEMESTER-4 (REGULATION: 2020-2021)) | INORGANIC CHEMISTRY- PRACTICAL-2 | 03 | CO1-Ability to quantitatively separate binary mixtures of ions in solution CO2-Estimation by volumetric, colorimetric CO3Estimation by gravimetric methods CO4- Ability to separate binary mixtures by ion-exchange method CO5- Ability to prepare inorganic complexes |

INORGANIC CHEMISTRY- PRACTICAL-2

| CO/POs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| CO1 | M | S | M | M | S | S | M | S | M | M |
| CO2 | S | M | S | M | M | S | M | M | S | S |
| CO3 | M | M | S | S | S | M | S | M | S | M |
| CO4 | S | S | M | S | S | S | S | S | M | M |
| CO5 | S | M | S | M | M | S | M | S | M | S |

SEMESTER IV

Sub.Name: PHYSICAL CHEMISTRY- PRACTICAL-2

No.of Hours per week:4

Sub.Code: DPCH 47

Course Outcome:

| Semester | Course Name | Course Credit | Course Outcomes |
|--|--------------------------------|---------------|--|
| M.Sc – II YEAR SEMESTER-4 (REGULATION: 2020-2021) | PHYSICAL CHEMISTRY- PRACTICAL1 | 03 | CO1- Draw and explain phase diagrams of one Component and two Component systems having congruent and incongruent melting points. CO2- Derive law of Chemical equilibrium and Van't Hoff isotherm. CO3- Determine molar mass from the colligative properties. CO4- Explain variation of conductivity with dilution, measurement of conductivity and concept of Transport Number and its determination. CO5- Explain Debye-Huckel Theory of strong electrolytes. |

PHYSICAL CHEMISTRY- PRACTICAL 2

| CO/POs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| CO1 | M | S | M | M | S | S | M | S | M | M |
| CO2 | S | M | S | M | M | S | M | M | S | S |
| CO3 | M | M | S | S | S | M | S | M | S | M |
| CO4 | S | S | M | S | S | S | S | S | M | M |
| CO5 | S | M | S | M | M | S | M | S | M | S |

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