

## PROGRAM OUTCOMES

On successful completion of Graduate & Post Graduate programme, graduating students/graduates will be able to:

### **PO 1 Domain Expertise:**

- Acquire comprehensive knowledge and skills.
- Make use of the knowledge in an innovative manner.
- Effectively apply the knowledge and skills to address various issues both academically and Technically.

### **PO 2 Learning and Research:**

- Learn “how to learn”- Self motivated and self directed learning.
- Adaptability towards ever emerging demands in work culture, place and life.
- Being inquisitive and establishing cause and effect relationship.
- Investigate and report.

### **PO 3 Modern equipment Usage**

- Use ICT effectively.
- Access, retrieve and use authenticated information.
- Having knowledge of software applications to analyse and give inference on data.

### **PO 4 Computing Skills and Ethics**

- Develop rationale and scientific thinking process.
- Use technology intelligently for communication, entertainment and for the benefit of mankind.
- Ensure ethical practices throughout ones endeavours for the well-being of human race.

### **PO 5 Complex problem Investigation & Solving**

- Predict and analyse problems.
- Frame hypotheses.
- Investigate and interpret empirical data.
- Plan and execute action.



  
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#### **PO 6 Perform effectively as Individuals and in Teams**

- Work efficiently as an individual
- Cooperate, coordinate and perform effectively in diverse teams/groups.
- Prioritize common interest to individual interest.

#### **PO 7 Efficient Communication & Life Skills**

- Express thoughts in an effective manner
- Listen, understand and project views in a convincing manner.
- Decide appropriate media to share information
- Develop skills to present significant information clearly and concisely to interested groups.

#### **PO 8 Environmental Sustainability**

- Understand sensibly the Environmental challenges.
- Think critically on environment sustainability measures.
- Propagate and follow environment friendly practices.

#### **PO 9 Societal contribution**

- Render service for the general good of the society.
- Involve voluntarily in social development activities at Regional, National, global levels.
- Have own pride in volunteering to address societal issues viz: calamities, disasters, poverty, epidemics.
- Be a patriotic citizen to uphold the values of the nation

#### **PO 10 Effective Project Management**

- Identify the goals, objectives and components of a project and decide the appropriate time of completion.
- Plan, organize and direct the endeavours' of teams to achieve the set targets in time.
- Be competent in identifying opportunities and develop strategies for contingencies.



  
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## PROGRAM SPECIFIC OUTCOMES

### B.Sc., Mathematics, Physics, Chemistry (M.P.C) OUTCOMES

**PSO 1:** Understand the theoretical concepts of physical and chemical properties of materials and the role of mathematics in dealing with them in a quantitative way.

**PSO 2:** Analyse the concepts of mathematics, physics and chemistry and understand the relation among them like physical chemistry, mathematical modelling of physics and chemistry problems.

Skills needed to handle instruments and adopt lab procedures to study physical chemical properties of materials.

**PSO 3:** Mathematical, numerical techniques required to model them.

**PSO 4:** Ability to interlink the skills and knowledge in mathematics, physics and chemistry and develop an aptitude to address the problems in biophysics, stock market analysis.

### B.Sc., Mathematics, ,Statistics, Computer Science (M.S.Cs) OUTCOMES

**PSO 1:** Understand the concepts of vector spaces, group theory, probability, distributions, sampling techniques, algorithm design, data base design and web design.

**PSO 2:** Analyse the concepts of mathematics, statistics and computers science able to use them in algorithm design and data science.

**PSO 3:** Acquire the skills to use various sampling techniques, statistical inference, data analysis in MS-Excel, implementation of numerical algorithms by using various programming languages.

**PSO 4:** Ability to interlink the skills developed and develop an aptitude to address the problems in DBMS, web and mobile app development.

### B.Sc., Mathematics, Physics, Computer Science (M.P.Cs) OUTCOMES

**PSO 1:** Understand the concepts of vector spaces, group theory, quantum mechanics, optical, thermal, electrical, mechanical properties of a materials, probability, algorithm design, data base

**PSO 2:** Understand the concepts of vector spaces, group theory, quantum mechanics, optical, thermal, electrical, mechanical properties of a materials, probability, algorithm design, data base



  
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**PSO 3:** Analyse the concepts of mathematics, physics and computers science able to relate them in numerical programming of models of physical systems.

**PSO 4:** Acquire the skills to study the properties of materials, implementation of numerical algorithms by using various

**PSO 5:** Ability to interlink the skills developed and acquires an aptitude to address the problems in simulations of material properties, web and mobile app development.

### **B.Sc., Mathematics, Electronics, Computer Science (M.E.Cs) OUTCOMES**

**PSO 1:** Understand the concepts of basic electronic components, networks, communication systems, microprocessors and micro controllers, algorithms, C language, Arduino programming, Networking, cloud and Big Data.

**PSO 2:** Analyse the concepts of mathematics, Electronics and computer Networks and able to use them in solving real world problems.

**PSO 3:** Acquire the skills to use various electronic components, microprocessor, microcontroller, Arduino, Raspberry PI and simulators.

**PSO 4:** Ability to interlink the skills developed and gets an aptitude to address the problems in smart home design, smart vehicles, smart sensors in various fields.



  
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DEPARTMENT OF COMMERCE

**B.Com (Computer Applications) Honours Program - Program Outcomes**

1. **\*\*Comprehensive Business Knowledge\*\***

- Graduates will have a thorough understanding of core business concepts across accounting, finance, marketing, and management, enabling them to make informed decisions in various business contexts.

2. **\*\*Advanced Computer Skills\*\***

- Graduates will be proficient in using contemporary computer applications and software essential for business operations, including Computerized Accounting, spreadsheets, and presentation tools.

3. **\*\*Effective Information Systems Management\*\***

- Graduates will be capable of designing, implementing, and managing information systems to improve business processes and enhance organizational efficiency.

4. **\*\*Proficient Financial Analysis\*\***

- Graduates will possess the skills to analyze financial statements, prepare detailed financial reports, and understand the financial implications of business decisions.

5. **\*\*Understanding Economic and Regulatory Environments\*\***



  
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- Graduates will comprehend the economic and regulatory landscapes affecting businesses and apply this knowledge to ensure compliance and capitalize on economic opportunities.

6. **\*\*Strong Communication Skills\*\***

- Graduates will be adept at communicating ideas clearly and persuasively, both in writing and orally, and will excel in teamwork and collaborative settings.

7. **\*\*Research and Analytical Capabilities\*\***

- Graduates will be skilled in conducting business research, utilizing quantitative and qualitative methods to analyze data and solve business problems effectively.

8. **\*\*Ethical and Professional Conduct\*\***

- Graduates will demonstrate high ethical standards and professionalism, making decisions that reflect integrity and adhering to established professional norms.

9. **\*\*Entrepreneurial and Innovative Thinking\*\***

- Graduates will have the knowledge and skills to initiate and manage new ventures, fostering creativity and innovation in their business endeavors.

10. **\*\*Global Business Awareness\*\***

- Graduates will understand global business dynamics, including cultural diversity and international market trends, and apply this knowledge to develop effective global business strategies.



  
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DEPARTMENT OF COMMERCE

**### B.Com Computer Applications - Specific Program Outcomes**

- 1. Seamless Integration of Business and Accounting Concepts through Computerized Accounting Software and creates awareness about Business Analytics to solve complex business problems.**
- 2. Advanced Financial and Analytical Skills to improve data-driven decision-making, improving financial performance and strategic planning.**
- 3. Expertise in Management and Administration activities for effective and smooth business operations**
- 4. Proficient Communication and Teamwork where students obtain enhancement of skills in written and verbal communication, facilitating clear, persuasive presentations and effective collaboration in diverse team environments.**
- 5. Commitment to Ethical Standards - Graduates will consistently demonstrate ethical behavior and professional integrity, adhering to the highest standards of conduct in all business practices.**



  
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**### B.Com (Computer Applications) Course - Course Outcomes**

**1. \*\*Integration of Business and Technology\*\***

- **Outcome**: Students will effectively integrate business principles with technological applications, demonstrating the ability to utilize software tools to solve business problems and enhance operational efficiency.

- **Skills Developed**: Technical proficiency, problem-solving, business analysis.

**2. \*\*Financial Literacy and Reporting\*\***

- **Outcome**: Students will be able to analyze and interpret financial data, prepare accurate financial reports, and make informed financial decisions that support business objectives.

- **Skills Developed**: Financial analysis, data interpretation, decision-making.

**3. \*\*Management Information Systems Proficiency\*\***

- **Outcome**: Students will understand the role and impact of management information systems in business, and will be able to design, implement, and manage IT solutions that improve business processes.

- **Skills Developed**: Systems analysis, IT management, project management.



  
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4. **\*\*Effective Business Communication\*\***

- **\*\*Outcome\*\***: Students will demonstrate strong communication skills, presenting business information clearly and persuasively in both written and oral forms, and working effectively in team environments.

- **\*\*Skills Developed\*\***: Communication, teamwork, leadership.

5. **\*\*Ethical and Professional Practices\*\***

- **\*\*Outcome\*\***: Students will exhibit ethical behavior and professionalism in business settings, understanding and applying ethical principles and professional standards in their decision-making processes.

- **\*\*Skills Developed\*\***: Ethical reasoning, professional conduct, integrity.

These course outcomes ensure that students completing the B.Com (Computer Applications) course are well-prepared to meet the demands of the modern business environment with a strong foundation in both business concepts and technological applications.



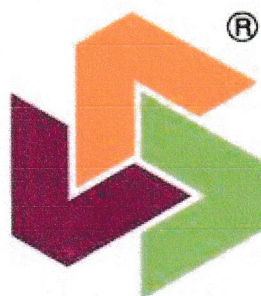
  
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UNIVERSAL LEARNING

**DEPARTMENT OF M.Sc. CHEMISTRY**

**M.Sc. ORGANIC CHEMISTRY**

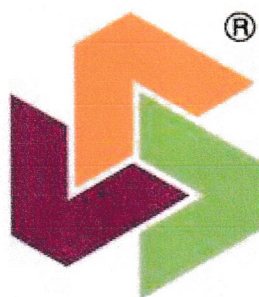
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## **PROGRAM OUTCOMES**



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**DEPARTMENT OF M.Sc. CHEMISTRY**

**M.Sc. ORGANIC CHEMISTRY**

# PROGRAM OUTCOMES

## M.Sc. ORGANIC CHEMISTRY

After the completion of the program, the students will be able to:

1. Work in the interdisciplinary and multidisciplinary areas of chemical sciences and its applications.
2. Analyze the data obtained from sophisticated instruments (like FTIR, NMR, GCMS, HPLC, GCMS, UV-Vis and TGA) for the structure determination and chemical analysis upon getting required knowledge and practice.
3. Apply green / sustainable chemistry approach towards planning and execution of research in frontier areas of chemical sciences.
4. Have sound knowledge about the fundamentals and applications of chemical and scientific theories.
5. Apply appropriate techniques for the qualitative and quantitative analysis of chemicals in laboratories and industries.
6. Acquire the ability to synthesize, separate and characterize compounds using laboratory and instrumentation techniques.
7. Carryout experiments in the area of organic analysis, estimation, separation, derivative process, inorganic semi micro analysis, preparation, conductometric and potentiometric analysis.
8. Learn about the potential applications and recent advances of Inorganic chemistry, Organic chemistry, Physical chemistry and Analytical chemistry.
9. Understand the background of organic reaction mechanisms, spectroscopy, Bio-inorganic chemistry, complex chemical structures, and instrumental method of chemical analysis, molecular rearrangements and separation techniques.
10. Work effectively and skillfully in teaching positions in government and private sectors and also in laboratories such as pharma, R&D, Analysis lab etc.
11. Can get through state and national competitive examinations such as CSIR, GATE etc.



  
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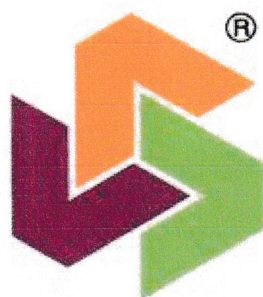
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**PROGRAM SPECIFIC OUTCOMES**



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**DEPARTMENT OF M.Sc. CHEMISTRY**

**M.Sc. ORGANIC CHEMISTRY**

# PROGRAM SPECIFIC OUTCOMES

## M.Sc. ORGANIC CHEMISTRY

On completing this specialization, the below mentioned outcomes are expected:

1. Students will be empowered with research-based in-depth understanding in the field of design and synthesis of complex molecules.
2. Students will have an understanding of chemical and molecular processes in chemical reactions.
3. Students will be able to use complicated analytical and spectroscopic methods to synthesize and characterize new products.
4. Students will learn about synthetically useful transformations like oxidations, reductions, enolate reactions, pericyclic reactions, organometallic reactions, and reactions of electron deficient species. The emphasis will be on developing a mechanistic understanding of selectivity and synthetic strategy.
5. Develop research oriented skills.



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## **COURSE OUTCOMES**



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**DEPARTMENT OF M.Sc. CHEMISTRY**

**M.Sc. ORGANIC CHEMISTRY**

## SEMESTER-I

### COURSE-I

#### General Chemistry-I

##### Course outcomes:

After completing the course, the student will be able to:

1. Understand the limitations of classical mechanics at molecular length scales.
2. Understand the differences between the classical and quantum mechanics.
3. Account for the basic principles and concepts of quantum mechanics.
4. Apply the principles of quantum mechanics to simple model systems relevance within chemistry.
5. understand the bases behind interaction between light and matter and account for the most common spectroscopic methods and their possibilities and limitations for studies of molecules in the MW, IR and UV-Visible areas.
6. Calculate different molecular parameters for simple molecules from their MW, IR, Raman and UV-Visible spectra.

After successful completion of the course, the students will be able to work effectively in teaching positions upto post-graduation and can get through state and national level competitive examinations like CSIR, GATE etc.

### COURSE - II

#### Inorganic Chemistry-I

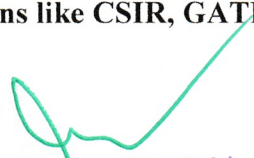
##### Course Outcomes:

On successful completion of this course, students will have the ability to:

1. Think critically and analyze chemical problems related to Inorganic Chemistry.
2. Present scientific and technical information resulting from laboratory experimentation in both written and oral formats.
3. Work effectively and safely in a laboratory environment.
4. Estimate elements qualitatively using theoretical knowledge and standard laboratory techniques/instruments and can synthesize and characterize compounds by using instrumentation.
5. To teach Chemistry up to post-graduation level.
6. Develop interest towards research and do the same by qualifying CSIR, GATE etc.

After successful completion of the course, the students will be able to work effectively and skillfully in analysis labs such as water analysis, soil analysis and in teaching positions and can get through state and national level competitive examinations like CSIR, GATE etc.



  
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**COURSE-III**  
**Organic Chemistry-I**

**Course Outcomes:**

The course aims to provide to the students:

1. A basic idea about aromaticity.
2. An idea about basic organic reaction mechanism concepts.
3. An understanding of Stereo Chemistry of Organic Molecules.
4. An idea about single step Organic Synthesis.
5. The ability to perform single step reactions independently.
6. The ability to use the basic operations of an organic chemistry laboratory including gravity & vacuum filtration, liquid-liquid extraction, distillation, reflux, recrystallization, drying of solids and solutions, and the theories behind these techniques.

**After successful completion of the course, the students will be able to work effectively and skillfully in pharma industry and in teaching positions and can get through CSIR, GATE**

**COURSE-IV**  
**Physical Chemistry-I**

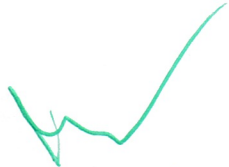
**Course outcomes:**

After completion of the course the student will able to

1. Apply principles and laws of equilibrium thermodynamics to multi component systems.
2. Calculate change in thermodynamic properties, partial molar quantities, chemical potential.
3. Identify the dependency of temperature and pressure on phase transitions.
4. Apply elementary laws of chemical kinetics and analyze reaction mechanisms.
5. Plot equations and functions representing kinetic behavior of the chemical systems in the ground and excited states.

**After successful completion of the course, the students will be able to work effectively and skillfully in pharma industry and in teaching positions and can get through CSIR, GATE**



  
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**SEMESTER-II**  
**COURSE-I**  
**General Chemistry-II**

**Course Outcomes:**

After completion of the course, the student will be able to:

1. Have an idea of structure of an atom, radial and angular probability distributions and shapes of atomic orbitals.
2. Determine the symmetry operations of any small and medium sized molecule and apply point group theory to the study of electrical, optical and magnetic properties and selection rules for absorption.
3. Apply the conceptual understanding of the statistical parameters to the analytical data.
4. Develop elementary programs in Fortran for performing scientific calculations.

**After successful completion of the course, the students will be able to work effectively in teaching positions and can get through state and national level competitive examinations like CSIR, GATE etc.**

**COURSE-II**  
**Inorganic Chemistry-II**

**Course Outcomes:**

On successful completion of this course, students :

1. Have a clear idea about molecular cluster, preparation, structure and bonding.
2. Got exact thought about organometallic chemistry and various Applications in industrial Inorganic chemistry.
3. Successfully exposed towards Stability, Kinetics, liability & inertness of various complexes.
4. Can understand about titrimetric, gravimetric Quantitative Analysis methods.

**After successful completion of the course, the students will be able to get extensive competitive knowledge to obtain CSIR, GATE examinations etc.**



  
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## COURSE-III

### Organic Chemistry-II

#### Course Outcomes:

The course aims to provide to the students:

1. A basic idea about protection and de-protection.
2. An idea about basic organic reaction mechanism concepts.
3. An understanding of Stereo Chemistry of Organic Molecules.
4. An idea about basic named reactions in Organic Chemistry.
5. Ability to perform Organic mixtures separations independently.
6. An idea to prepare derivatives for organic compounds with specific functional groups.
7. An idea in the confirmation of functional groups present in the organic compounds.

**After successful completion of the course, the students will be able to work in teaching positions upto post-graduation and can get through state and national level competitive examinations like CSIR, GATE etc.**

## COURSE-IV

### Physical Chemistry-II


#### Course Outcomes:

After completion of the course students will be able to:

1. Recognize the fundamental principle of magnetic resonance through theory and implement them to simple examples.
2. Recognize the fundamental principles of statistical thermodynamics, their application for obtaining absolute values for thermodynamic parameters using partition functions.
3. Write equations representing electrochemical cell.
4. Calculate electrochemical cell parameters and certain thermodynamic parameters using emf data.

**After successful completion of the course, the students will be able to work in teaching positions upto post-graduation and can get through state and national level competitive examinations like CSIR, GATE etc.**



  
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## SEMESTER - III

### COURSE-I

#### Organic Reaction Mechanisms-I and Pericyclic Reactions

**Course Outcomes:** The course aims to impart to the students:

1. The concept stereochemistry and its importance.
2. What is aliphatic nucleophilic substitution.
3. An understanding of the various types of aliphatic nucleophilic substitution.
4. To learn what is aromatic substitution reaction.
5. The various types of aromatic substitution reaction and their Mechanism.
6. General introduction to the activation of chemical reactions. Thermal and photochemical methods, molecular orbitals of conjugated polyenes and their symmetry properties, definition and classification of pericyclic reactions methods of analyzing pericyclic reactions.

**After completion of this course student can get an opportunity to work as Chemical Scientist in Pharma & allied Industries and can get through examinations like CSIR, GATE etc.**

### COURSE - II

#### Organic Spectroscopy-I

**Course Outcomes:** The course helps the students to:

1. Learn about the Principle and applications of ultraviolet and Woodward Fisher Rule.
2. Understand the infra-red spectroscopy in organic structure determination.
3. Know about the Nuclear magnetic resonance spectroscopy. Proton chemical shift, spin-spin coupling, coupling constants and applications to organic structures  $^1\text{H}$  &  $^{13}\text{C}$  resonance spectroscopy.
4. Learn the Mass spectrometry and its applications.

**After completion of this course student can get an opportunity to work as Chemical Scientist in Pharma & allied Industries and can get through examinations like CSIR, GATE etc.**



  
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## COURSE-III

### Modern Organic Synthesis-I

#### Course Outcomes:

The course enables the students to:

1. Have a firm foundation in the fundamentals and application of Modern Organic Synthesis.
2. Be able to design and carry out scientific experiments as well as accurately record and analyze the results of such experiments.
3. Develop basic skills for the multi-step synthesis of organic compounds.
4. Justify a reasonable mechanism for a chemical reaction.
5. Illustrate chemical structures stereochemistry and chemical reactions.
6. Write comprehensive reports on experiments such crystallization, distillation, synthesis, hydrogenation and filtration processes.
7. Get an idea about reasonable high-yield synthesis of a target molecule from given organic starting materials.
8. Get understanding of physical properties of organic molecules.
9. Get an idea about understanding of chemical and molecular processes that take place in organic chemical reactions.
10. Get an idea about research-based in-depth understanding in the field of design and production (synthesis) of complex molecules.

**After completion of this course student can get an opportunity to work as Research & Development Scientist in Pharma Industries.**

## COURSE-IV

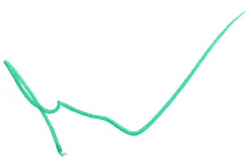
### Chemistry of Natural Products

#### Course Outcomes:

The students will acquire the knowledge of:

1. Basic classification and role of alkaloids.
2. The structural elucidation and degradation of alkaloids.
3. The synthesis and structure of alkaloids.
4. The stereochemistry of alkaloids.
5. Understanding the isolation and structural determination of alkaloids.
6. Terpenoids and its classification.
7. Studying isoprene rule.
8. Understanding the isolation and structural determination of Flavonoids and Iso-flavonoids.



  
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## SEMESTER -IV

### COURSE - I

#### Organic Reaction Mechanisms-II and Organic Photochemistry

**Course Outcomes:** By the end of the course students will be able to:

1. Discuss nucleophilic aromatic substitution reaction and benzyne mechanisms.
2. Explain Neighboring group participation in aliphatic Electrophilic substitution.
3. Discuss ambident nucleophiles, non-classical carbocation & SET mechanism.
4. Understand Organic photochemistry introduction, definitions, importance electronic excitation and spin configurations - Jabolanski diagram.
5. Understand the process of energy transfer and electron transfer processes - quenching of excited states.
6. Understand Photochemistry of carbonyl compounds.
7. Analyze Photochemistry of olefins, enones and dienones, photochemistry of aromatic molecules, molecular oxygen and organic photochemistry, supramolecular organic photochemistry.
8. Discuss the Photochemistry of  $\pi$ -\* transitions with particular reference to cis- trans isomerization and Di-Pi methane rearrangement.
9. Discuss the Photochemistry of (n-\*) transitions with particular reference to Norrish type I, Norrish II type reactions, Paterno-Bucchi reactions & photochemistry of nitrites.

**After completion of this course student can get an opportunity to work as Chemical Scientist in Pharma & allied Industries and can get through examinations like CSIR, GATE etc.**

### COURSE II


#### Organic Spectroscopy-II

##### Course outcomes:

After completing the course, Students will be able to

1. Gain the knowledge about the Chiroptical Properties & its curves and also learn & apply the empirical and semi empirical rules.
2. Apply the principles of magnetic resonance and other spectroscopic techniques in elucidation of organic compounds, to learn and understand:
3. The definition of Adsorption and partition chromatography.
4. The Column, Paper, Thin Layer Chromatography.
5. The High-Performance Thin Layer Chromatography.
6. The two-dimensional Paper Chromatography, Reverse phase Paper Chromatography.
7. The Gas-liquid Chromatography.
8. The applications of Gas-liquid Chromatography.
9. The High-Performance Liquid chromatography.



  
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10. The application of techniques of chromatography in separation of compounds practically.

**After completion of this course student can get an opportunity to work as Research & Development Scientist and Quality Control Chemist in Pharma & allied Industries and can clear national level examinations like CSIR, GATE etc.**

### **COURSE-III**

#### **Modern Organic Synthesis-II**

##### **Course Outcomes:**

After going through the course, the students will:

1. Have a firm foundation in the fundamentals and application of reagents and reactions in Modern Organic Synthesis-II.
2. Be able to design and carry out scientific experiments as well as accurately record and analyze the results of such experiments.
3. Develop basic skills for the multi-step synthesis of organic compounds.
4. Justify a reasonable mechanism for a chemical reaction.
5. Illustrate chemical structures stereochemistry and chemical reactions.
6. Write comprehensive reports on experiments such crystallization, distillation, synthesis, hydrogenation and filtration processes.

**After completion of this course student can get an opportunity to work as Research & Development Scientist and Bio-Analysist in Pharma & allied Industries can clear national level examinations like CSIR, GATE etc.**

### **COURSE - IV**

#### **Bio-Organic Chemistry**


##### **Course Outcomes:**

By the end of this course the students will acquire knowledge of:

1. Metabolic process in all living organism.
2. Various pathways like ATP, role of various enzymes, role of amino acids, and proteins.
3. DNA structure, transfer of genetic information from one generation to another generation.
4. Understanding the complexity of biological reactions in a living organism.
5. Role of vitamins, its biosynthesis, advantage and disadvantages in a living organism.
6. Bioactive molecules in maintaining a healthy life.
7. This course provides basic knowledge of metabolic process in all living organism.

Further it enables the students will understand various pathways like ATP, role of various enzymes, role of amino acids, and proteins. This course will also explain DNA structure, transfer of genetic information from one generation to another generation, disorders etc.



  
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**DEPARTMENT OF M.Sc. CHEMISTRY**

**M.Sc. ANALYTICAL CHEMISTRY**



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## **PROGRAM OUTCOMES**



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**DEPARTMENT OF M.Sc. CHEMISTRY**


**M.Sc. ANALYTICAL CHEMISTRY**

# PROGRAM OUTCOMES

## M.Sc. ANALYTICAL CHEMISTRY

The aim of the program is to impart to the students the ability to:

1. Think critically and analyze chemical problems.
2. Present scientific and technical information resulting from laboratory experimentation in both written and oral formats.
3. Work effectively and safely in a laboratory environment.
4. Synthesize, separate and characterize compounds qualitatively and quantitatively using theoretical knowledge and standard laboratory techniques/instruments.
5. Use technologies/instrumentation to gather and analyze data.
6. Be competent enough to teach Chemistry up to post-graduation level.
7. Develop interest towards research and do the same by qualifying CSIR,GATE etc.
8. Work in teams as well as independently.
9. Apply modern methods of analysis to chemical systems in a laboratory setting. Helps in understanding the causes of environmental pollution and can open up new methods for environmental pollution control.



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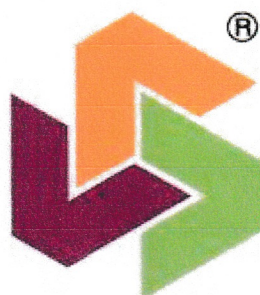
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## **PROGRAM SPECIFIC OUTCOMES**



**VISHNU**  
UNIVERSAL LEARNING

**DEPARTMENT OF M.Sc. CHEMISTRY**

**M.Sc. ANALYTICAL CHEMISTRY**

# PROGRAM SPECIFIC OUTCOMES

## M.Sc. ANALYTICAL CHEMISTRY

On completing this specialization, the below mentioned outcomes are expected:

1. Provide students with an opportunity to work with advanced analytical instrumentation in state-of-the-art laboratories dedicated both to education and also to research.
2. Students will have a thorough theoretical and practical understanding of advanced analytical instruments.
3. Students will get advanced knowledge in the area of modern primary characterization techniques in chemistry.
4. Develop knowledge and research skills applicable to a career in modern analytical chemistry,
5. Students will work within a small team to undergo practical-based research, particularly on characterization and analytical instrumentation.



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## **COURSE OUTCOMES**



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**DEPARTMENT OF M.Sc. CHEMISTRY**

**M.Sc. ANALYTICAL CHEMISTRY**



## **SEMESTER-I**

### **COURSE-I**

#### **General Chemistry-I**

##### **Course outcomes:**

After completing the course, the student will be able to:

1. Understand the limitations of classical mechanics at molecular length scales.
2. Understand the differences between the classical and quantum mechanics.
3. Account for the basic principles and concepts of quantum mechanics.
4. Apply the principles of quantum mechanics to simple model systems relevance within chemistry.
5. understand the bases behind interaction between light and matter and account for the most common spectroscopic methods and their possibilities and limitations for studies of molecules in the MW, IR and UV-Visible areas.
6. Calculate different molecular parameters for simple molecules from their MW, IR, Raman and UV-Visible spectra.

**After successful completion of the course, the students will be able to work effectively in teaching positions up to post-graduation and can get through state and national level competitive examinations like CSIR, GATE etc.**

### **COURSE - II**

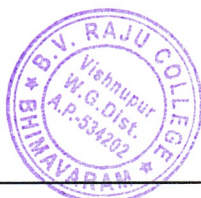
#### **Inorganic Chemistry-I**


##### **Course Outcomes:**

On successful completion of this course, students will have the ability to:

1. Think critically and analyze chemical problems related to Inorganic Chemistry.
2. Present scientific and technical information resulting from laboratory experimentation in both written and oral formats.
3. Work effectively and safely in a laboratory environment.
4. Estimate elements qualitatively using theoretical knowledge and standard laboratory techniques/instruments and can synthesize and characterize compounds by using instrumentation.
5. To teach Chemistry up to post-graduation level.
6. Develop interest towards research and do the same by qualifying CSIR, GATE etc.

**After successful completion of the course, the students will be able to work effectively and skillfully in analysis labs such as water analysis, soil analysis and in teaching positions and can get through state and national level competitive examinations like CSIR, GATE etc.**



  
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**COURSE-III**  
**Organic Chemistry-I**

**Course Outcomes:**

The course aims to provide to the students:

1. A basic idea about aromaticity.
2. An idea about basic organic reaction mechanism concepts.
3. An understanding of Stereo Chemistry of Organic Molecules.
4. An idea about single step Organic Synthesis.
5. The ability to perform single step reactions independently.
6. The ability to use the basic operations of an organic chemistry laboratory including gravity & vacuum filtration, liquid-liquid extraction, distillation, reflux, recrystallization, drying of solids and solutions, and the theories behind these techniques.

**After successful completion of the course, the students will be able to work effectively and skillfully in pharma industry and in teaching positions and can get through CSIR, GATE**

**COURSE-IV**  
**Physical Chemistry-I**

**Course outcomes:**

After completion of the course the student will able to

1. Apply principles and laws of equilibrium thermodynamics to multi component systems.
2. Calculate change in thermodynamic properties, partial molar quantities, chemical potential.
3. Identify the dependency of temperature and pressure on phase transitions.
4. Apply elementary laws of chemical kinetics and analyze reaction mechanisms.
5. Plot equations and functions representing kinetic behavior of the chemical systems in the ground and excited states.

**After successful completion of the course, the students will be able to work effectively and skillfully in pharma industry and in teaching positions and can get through CSIR, GATE**



  
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**SEMESTER-II**  
**COURSE-I**  
**General Chemistry-II**

**Course Outcomes:**

After completion of the course, the student will able to:

1. Have an idea of structure of an atom, radial and angular probability distributions and shapes of atomic orbitals.
2. Determine the symmetry operations of any small and medium sized molecule and apply point group theory to the study of electrical, optical and magnetic properties and selection rules for absorption.
3. Apply the conceptual understanding of the statistical parameters to the analytical data.
4. Develop elementary programs in Fortran for performing scientific calculations.

**After successful completion of the course, the students will be able to work effectively in teaching positions and can get through state and national level competitive examinations like CSIR, GATE etc.**

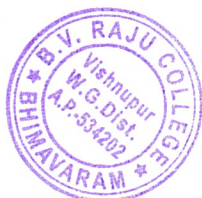
**COURSE-II**  
**Inorganic Chemistry-II**

**Course Outcomes:**

On successful completion of this course, students :

1. Have a clear idea about molecular cluster, preparation, structure and bonding.
2. Got exact thought about organometallic chemistry and various Applications in industrial Inorganic chemistry.
3. Successfully exposed towards Stability, Kinetics, liability & inertness of various complexes.
4. Can understand about titrimetric, gravimetric Quantitative Analysis methods.

**After successful completion of the course, the students will be able to get extensive competitive knowledge to obtain CSIR, GATE examinations etc.**



  
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**COURSE-III**  
**Organic Chemistry-II**

**Course Outcomes:**

The course aims to provide to the students:

1. A basic idea about protection and de-protection.
2. An idea about basic organic reaction mechanism concepts.
3. An understanding of Stereo Chemistry of Organic Molecules.
4. An idea about basic named reactions in Organic Chemistry.
5. Ability to perform Organic mixtures separations independently.
6. An idea to prepare derivatives for organic compounds with specific functional groups.
7. An idea in the confirmation of functional groups present in the organic compounds.

**After successful completion of the course, the students will be able to work in teaching positions upto post-graduation and can get through state and national level competitive examinations like CSIR, GATE etc.**

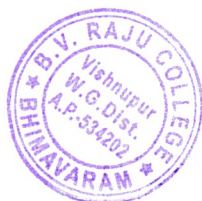
**COURSE-IV**  
**Physical Chemistry-II**

**Course Outcomes:**

After completion of the course students will be able to:

1. Recognize the fundamental principle of magnetic resonance through theory and implement them to simple examples.
2. Recognize the fundamental principles of statistical thermodynamics, their application for obtaining absolute values for thermodynamic parameters using partition functions.
3. Write equations representing electrochemical cell.
4. Calculate electrochemical cell parameters and certain thermodynamic parameters using emf data.

**After successful completion of the course, the students will be able to work in teaching positions upto post-graduation and can get through state and national level competitive examinations like CSIR, GATE etc.**



  
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## **SEMESTER-III**

### **COURSE-I**

#### **Separation Methods-I**

##### **Course Outcomes:**

The course aims to introduce the students to:

1. Introduction to Chromatography – Vandemeter equation.
2. The basic components of the Instruments like GC, HPLC, etc.
3. The various applications of HPLC and GC.
4. The applications of Size Exclusion, affinity Chromatography Techniques and Counter Current Separation Techniques in Pharma and Bio Industries.
5. The importance of Coupled Instruments like GC-MS and LC-MS.

**After successful completion of the course, the students will be able to work effectively and skillfully in analysis labs such as water analysis, soil analysis, can get selected as chemist at analysis labs such as GSI, FSSAI etc. and in teaching positions and can get through state and national level competitive examinations.**

### **COURSE - II**

#### **Quality Control and Traditional methods of Analysis-I**

##### **Course Outcomes:**

The course aims to provide to the students the knowledge of:

1. Identifying the quality of experimental measurements, defines the confidence limits and confidence levels. Compare the experimental mean with true value and identify the detection limits.
2. The concept of different dissolution techniques and their applications.
3. Understanding about the applications and uses of Analytical Methods in Chemistry.
4. The concepts of different Organic Functional Group Analysis like Mercaptans, Amines, Carbonyl Compounds, and Diols etc.
5. Expressing and calculating the terms such as Mean, Standard Deviation, Variance, Relative standard deviation and Co efficient of Variance.
6. The concepts of Quality Control, Quality assurance and Total Quality Management.
7. The concepts of GLP, and elements and series of ISO 9000 and ISO14000.
8. Principles and applications of different oxidant systems.

**After successful completion of the course, the students will be able to work effectively and skillfully in Pharma labs as QC/QA, teaching positions and can get through state and national level competitive examinations.**



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## **COURSE - III**

### **Applied Analysis-I**

#### **Course Outcomes:**

After completion of this course the students will be able to:

1. Gets overall knowledge about the analysis of Finished Products in various industries like Steel. Cosmetics and Paints.
2. Know about Water Quality Parameters such as D.O., BOD, and COD.
3. Know the basic concepts of Sampling, dissolution, separation and estimation of the constituents present in samples such as Ores, Fluxes, refractory Materials.
4. Know about the analysis of different Industrial Products like Oils, soaps, and face powder.
5. About classification and effects of different water pollutants on human health.
6. Know about different types of ores and their composition.
7. Learn the analysis of different toxic metals present in waste water.
8. Learn about various methods for the analysis of cations and anions.

**After successful completion of the course, the students will be able to work effectively and skillfully in water and soil analysis labs, teaching positions and can get through state and national level competitive examinations.**

## **COURSE - IV**

### **Instrumental Methods of Analysis-I**


#### **Course Outcomes:**

After completing the course, the student will be able to:

1. Understand the basic components of Instruments like XRD, IR, NMR, ESR etc.
2. Students should know about various applications of NMR, IR, Colorimetric, and Fluorimetry.
3. Apply the principle of UV-Visible Spectroscopy in identifying and estimating the colored compound. Mixed Colored Compounds and Transition Metals.
4. The structure and Analysis of different Vitamins by Spectro Fluorimetry.
5. Know about structural elucidation of different Organic Compound using IR and Raman Spectrometers.
6. Know about the differences of various technique such as NMR, ESR, IR, Raman etc.

**After completion of this course student can get an opportunity to work as Chemical scientist in Pharma and allied Industries.**



  
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## **SEMESTER -IV**

### **COURSE - I**

#### **Separation Methods-II**

##### **Course Outcomes:**

The course aims to impart to the students the knowledge and understanding of:

1. Basic separation techniques such as Solvent Extraction. Ion Exchange and Chromatography.
2. The Principle and Applications of Paper, TLC, HPTLC & Column Chromatography.
3. Sampling Techniques.
4. The concept of Liquid - Liquid Partition Chromatography, Crown Ethers in Extraction, Super Fluid Chromatography etc.
5. The Dynamics of Chromatography.

**After completion of this course student can get an opportunity to work as Chemist in Pharma and other analysis Industries.**

### **COURSE-II**

#### **Traditional methods of Analysis-II**

##### **Course Outcomes:**

After completing the course, the students will be able to:

1. Interpret different Gravimetric Analysis Methods. Solves Problems related to Gravimetric Methods and its applications.
2. Identify the quality of experimental measurements. defines the confidence limits and confidence levels. Compare the experimental mean with true value and identify the detection limits.
3. Estimate the types and sources of errors in Chemical analysis.
4. To develop an understanding about the range and uses of Analytical Methods in Chemistry.
5. Know about Crystal Behavior. Formation. Impurities formed during the precipitation process.
6. Know the concepts of different Organic Functional Group Analysis like Mercaptans, Amines, Carbonyl Compounds, Diols etc.
7. Express and calculate the terms such as Mean, Standard Deviation, Variance. Relative standard deviation and Co efficient of Variance.
8. Know the concepts of Quality Control, Quality assurance and Total Quality.
9. Management, GLP, and importance of ISO 9000, ISO14000.

**After completion of this course student can get an opportunity to work as Chemist in Pharma & Allied Industries.**



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**COURSE - III**  
**Applied Analysis-II**

**Course Outcomes:**

After completing this course, the students will acquire knowledge of

1. The basic concepts of Sampling, dissolution, separation and estimation of the constituents present in samples such as Ores. Fluxes, refractory Materials.
2. Kinetic methods of analysis and its applications.
3. Calculation of moisture content of different Drugs by using KF Reagent.
4. The analysis of different Industrial Products like Coal.
5. Water Pollution and Air Pollution.
6. The differences between aqueous and Non-aqueous Titrations.

**After completion of this course student can get an opportunity to work as Chemist in Coal, Cement & Soil Industries.**

**COURSE-IV**  
**Instrumental Methods of Analysis-II**

**Course Outcomes:**

The course aims to provide to the students the knowledge and understanding of

1. The importance of electro analytical methods such as Voltammetry. Coulometry and Polarography.
2. The importance of Thermal Methods of analysis in various industries and advanced analytical Instruments like AAS.ICP-OES, ICP-MS.
3. The applications of Radiometric methods of analysis in investigating of lunar surface.

**After completion of this course student can get an opportunity to work as Chemical Scientist in Pharma & allied Industries.**



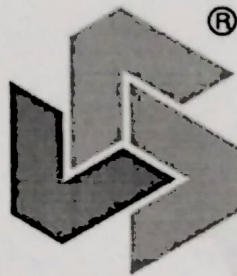
  
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**VISHNU**  
UNIVERSAL LEARNING

**DEPARTMENT OF MCA**

**MASTER OF COMPUTER APPLICATIONS**



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## **PROGRAM OUTCOMES**



**VISHNU**  
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**DEPARTMENT OF MCA**

**MASTER OF COMPUTER APPLICATIONS**



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# PROGRAM OUTCOMES

## MASTER OF COMPUTER APPLICATIONS

**PO1: Computational Knowledge:** Apply the knowledge of computing fundamentals to various real life applications to any given requirement.

**PO2 Problem Analysis:** Identify, formulate and solve complex computing problems reaching substantiated conclusions.

**PO3 Development of Solutions:** Design and evaluate solutions for complex computing problems with appropriate consideration.

**PO4 Investigations of complex Computing problems:** Use research-based knowledge and research methods for analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

**PO5 Modern Tool Usage:** Create, identify and apply appropriate techniques, resources, and modern computing tools to complex computing activities.

**PO6 Professional Ethics:** Understand and commit to professional ethics and cyber regulations for professional computing practices.

**PO7 Life-long Learning:** Identify the need and have the ability, to engage in independent learning as a computing professional.

**PO8 Project management and finance:** Understand and apply computing, management principles to manage multidisciplinary projects.

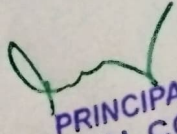
**PO9 Communication Efficiency:** Communicate effectively with the computing community and with society.

**PO10 Societal and Environmental Concern:** Understand and assess societal, environmental, health, safety, legal, and cultural issues.

**PO11 Individual and Team Work:** Function effectively in diverse teams and in multidisciplinary environments.

**PO12 Innovation and Entrepreneurship:** Identify a timely opportunity and using innovation to pursue that opportunity..



  
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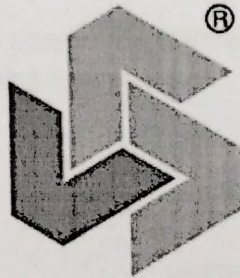
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## **PROGRAM SPECIFIC OUTCOMES**



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**DEPARTMENT OF MCA**

**MASTER OF COMPUTER APPLICATIONS**



A handwritten signature in green ink, appearing to be the name of the principal.

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# PROGRAM SPECIFIC OUTCOMES

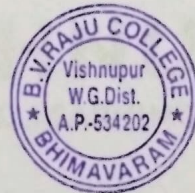
## MASTER OF COMPUTER APPLICATIONS

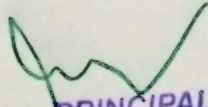
**PSO1:** Apply the knowledge of computer application to find solutions for real-life application

**PSO2:** Ability to analyze, design, develop and maintain the software application with latest technologies

**PSO3:** Utilize skills and knowledge for computing practice with commitment on social, ethical, cyber and legal values.

**PSO4:** Inculcate employability and entrepreneur skills among students who can develop customized solutions for small to large Enterprises.



  
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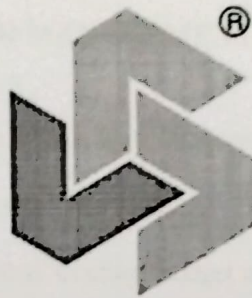
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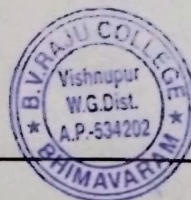
## COURSE OUTCOMES



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MASTER OF COMPUTER APPLICATIONS



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# MASTER OF COMPUTER APPLICATIONS

## SEMESTER-I

### MCA-20101 DISCRETE MATHEMATICAL STRUCTURES

#### Course outcomes:

After completing the course, the student will be able to:

- C101.1 Understand about introduction of discrete mathematical structures.
- C101.2 Understand the Counting Techniques and Recurrence relations.
- C101.3 Understand about in detail about Graphs and Trees.
- C101.4 Understand about Boolean Algebra and Models of Computation.

### MCA-20102 MANAGEMENT ACCOUNTANCY

#### Course Outcomes:

- C102.1 Understand the basic concept of Principles Of Accounting and Final Accounts.
- C102.2 Understand about in detail about Ratio Analysis.
- C102.3 Understand about the concepts of Costing, Budget and Budgetary Control, Marginal Costing.
- C102.4 Understanding the Introduction To Computerized Accounting System.

### MCA-20103 C PROGRAMMING AND DATA STRUCTURES

#### Course Outcomes:

- C103.1 Understand the Fundamentals and Basic concepts of C Programming.
- C103.2 Understand about in detail about Arrays, Functions and Pointers.
- C103.3 Understand the concepts of Derived Data Types and Data Structures.
- C103.4 Understand the concepts of Linked Lists, Trees, Graphs, Searching and Sorting.

### MCA-20104 COMPUTER ORGANIZATION

#### Course Outcomes:

- C104.1 Understand the basics of Digital Logic Circuits and Digital Components.
- C104.2 Understand about the Concepts of Data Representation, Register Transfer and Micro operations.



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C104.3 Understand the concept of Basic Computer Organization and Design and Central Processing Unit.

C104.4 Understand about the concept of Input /Output Organization and Memory Organization.

### **MCA-20105 OPERATING SYSTEMS**

#### **Course Outcomes:**

C105.1 Understand the concept of Introduction to Operating Systems and Process Management.

C105.2 Understand about Process Synchronization and Deadlocks in detail.

C105.3 Understand about the concept of Memory Management, File System Implementation, Mass-storage structure.

C105.4 Understand the concept of Protection and Case Study.

### **MCA-20106 DESIGN AND ANALYSIS OF ALGORITHMS**

#### **Course Outcomes:**

C106.1 Understand about the Asymptotic Notations, Mathematical Analysis of Non- recursive and recursive Algorithms and Selection Sort and Bubble sort, Sequential Search and Exhaustive Search.

C106.2 Understand about the Divide-and-Conquer technique, Decrease-and-Conquer and Transform-and-Conquer techniques.

C106.3 Understand the Optimal Binary Search Trees, The Knapsack Problem Prim's Algorithm, Kruskal's Algorithm, Dijkstra's Algorithm.

C106.4 Understand about the Decision Trees, P, NP and NP- complete problems, Backtracking, Branch-and-Bound, Approximation Algorithms for NP-hard Problems.

### **MCA-20110 BRIDGE COURSE (FUNDAMENTALS OF COMPUTERS) (For**

**General B.Sc/B.A./B.Com Students)**

#### **Course Outcomes:**

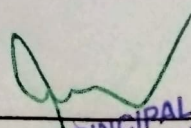
C110.1 Explain the concept of input and output devices of Computers and how it works and recognize the basic terminology used in computer programming

C110.2 Able to develop techniques of writing algorithms pseudo codes and logic

C110.3 Summarize the concepts of Operating Systems

C110.4 Recognize the Computer networks, types of networks and topologies, network devices and get introduction to internet and email.



  
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## SEMESTER-II

### MCA-20201 COMPUTER NETWORKS

#### Course Outcomes:

- C201.1 Understand the basics of computer networks and Data Communication.
- C201.2 Understand about Data Link Layer, IEEE Standards, design issues in networks.
- C201.3 Understand Internet Transport Protocols and different types of protocols.
- C201.4 Overview of various types of Network Devices and different types of Networks

### MCA-20202 OBJECT ORIENTED PROGRAMMING THROUGH JAVA

#### Course Outcomes:

- C202.1 Understand Introduction to OOP and concept of Inheritance.
- C202.2 Understand about Interfaces, Packages and Enumeration, Exceptions & Assertions.
- C202.3 Understand about Multithreading and Applets.
- C202.4 Understand the concept of Event Handling and Abstract Window Toolkit.

### MCA-20203 DATABASE MANAGEMENT SYSTEMS

#### Course Outcomes:

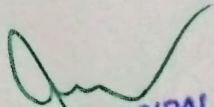
- C203.1 Able to understand the Introduction of Database System, Data Modeling Using the Entity-Relationship Model
- C203.2 Able to understand Relational Data Model and Relational Database Constraints, Relational Algebra and Relational Calculus, Schema Definition, Basic Constraints and Queries
- C203.3 Able to understand Relational Database Design, Indexing Structures for Files
- C203.4 Able to understand Transaction Processing, Concurrency Control Techniques

### MCA-20204 FORMAL LANGUAGES & AUTOMATA THEORY

#### Course Outcomes:

- C204.1 Understand the concept of Finite Automata and Regular Expressions, Regular sets & Regular Grammars.
- C204.2 Understand the concept of Context Free Grammars and Languages, Push down



  
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Automata

C204.3 Understand about Turing Machines, Universal Turing Machines and Undecidability in detail.

C204.4 Understand the concept of The Propositional calculus and The Predicate calculus.

### MCA-20205 DATA MINING CONCEPTS AND TECHNIQUES

#### Course Outcomes:

C205.1 Able to understand about the overview of Data Warehouse Basic Concepts, Data Warehouse Modelling, Pre-processing

C205.2 Able to understand about the Introduction to Data Mining , Basic Statistical Descriptions of Data, Data Visualization, Measuring data Similarity and Dissimilarity

C205.3 Able to understand about the Concept Description, Generalization by AOI , Mining Frequent Patterns, Associations and Correlations, Mining Frequent Item set

C205.4 Able to understand about the Basic Concepts of Classification ,Different Methods of Classification

### MCA-20206 INTERNET OF THINGS (Elective-I)

#### Course Outcomes:

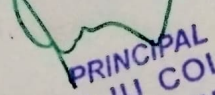
C206.1 Able to understand about the Introduction to Internet of Things, IoT Enabling Technologies, IoT Levels & Deployment Templates Domain Specific IoTs

C206.2 Able to understand about the IOT & M2M, SNMP

C206.3 Able to understand about the IoT Platforms Design Methodology

C206.4 Able to understand about the IoT Physical Devices & Endpoints



  
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## SEMESTER - III

### MCA-20301 INFORMATION SECURITY AND CRYPTOGRAPHY

#### Course Outcomes:

- C301.1 Able to understand the security approaches and techniques, Introduction to number theory
- C301.2 Able to Symmetric key and Asymmetric key cryptographic algorithms
- C301.3 Able to understand the User Authentication Mechanisms ,System security
- C301.4 Able to understand the Internet Security Protocols and Network Security

### MCA-20302 BIG DATA ANALYTICS

#### Course Outcomes:

- C302.1 Understand about introduction to Big Data and Hadoop
- C302.2 Understand about Real Time Analytics, Map Reduce Programming
- C302.3 Understand about Streaming in Spark, Machine Learning, Map Reduce Advanced Programming
- C302.4 Understand about Graph Representation in Map Reduce, Graph Analytics in Spark, Programming with RDDs-Basics, Spark SQL overview

### MCA-20303 OBJECT ORIENTED SOFTWARE ENGINEERING

#### Course Outcomes:

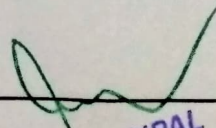
- C303.1 Able to understand about the Introduction to Object Oriented Software Engineering, Object Orientation, Requirements Engineering
- C303.2 Able to understand about the Unified Modeling Language & Use Case Modeling, Class Design and Class Diagrams
- C303.3 Able to understand about the Software Design and Architecture, Design Patterns
- C303.4 Able to understand about the Software Testing, Software Project Management, Software Process Models

### MCA-20304 WEB TECHNOLOGIES

#### Course Outcomes:

- C304.1 Understand the concept of Networking Protocols and OSI Model, Internetworking Concepts, Devices, Basics, History and Architecture.



  
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- C304.2 Understand about TCP/IP and Electronic commerce in detail.
- C304.3 Understand about the concept of Web Technology and types of Web Pages.
- C304.4 Understand the concept of Middleware and Component-based E-commerce Architectures, EDI, XML and WAP.

#### MCA- 20305 CLOUD COMPUTING (ELECTIVE-II)

##### **Course Outcomes:**

- C305.1 Able to understand about the Cloud Computing basics, Intranet and Cloud, Services and Business Applications, Salesforce.com, Organization and Cloud Computing
- C305.2 Able to understand about the Hardware and Infrastructure , Overview of Software as a Service, Overview of Industries Software plus Services, Mobile device Integration
- C305.3 Able to understand about Developing the Applications like Google, Microsoft, Intuit QuickBase, Local Clients and thin clients
- C305.4 Able to understand about the Migrating the Cloud, Cloud Services

#### MCA-20306 FOUNDATIONS OF DATA SCIENCE(ELECTIVE III)

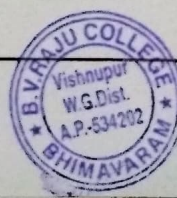
##### **Course Outcomes:**

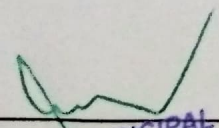
- C306.1 Understand about Key concepts in data science, including tools, approaches, and application scenarios
- C306.2 Understand about Topics in data collection, sampling, quality assessment and repair
- C306.3 Understand about Topics in statistical analysis and machine learning
- C306.4 Understand about State-of-the-art tools to build data-science applications for different types of data, including text and CSV data

#### MCA-20309 INNOVATION, ENTREPRENEURSHIP AND INTELLECTUAL PROPERTY RIGHTS

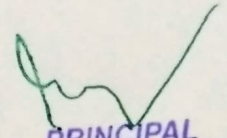
##### **Course Outcomes:**

- C309.1 Able to understand Role and importance Technology developments, Innovation in Current Environment
- C309.2 Able to understand Entrepreneurship and Its Evolution
- C309.3 Able to understand Intellectual Property Law
- C309.4 Able to understand Patent Law – Rights and Limitations



  
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**SEMESTER -IV**  
**MCA-20401 PROJECT WORK**



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