VSPM Academy of Higher Education
Jawaharlal Nehru Arts, Commerce and Science College Wadi, Nagpur
Dist. Nagpur (Maharashtra) 440023

Criterion II
Teaching-Learning and Evaluation

2.6 Student Performance and Learning Outcome

2.6.1. Programme Outcomes (POs) and Course Outcomes (COs) for all Programmes offered by the institution are stated and displayed on website

VSPM Academy of Higher Education Nagpur's

Jawaharlal Nehru Arts, Commerce and Science College, Wadi, Nagpur- 440023 (M.S.)

(Affiliated to RTM Nagpur University, Nagpur)

Website: www.jncwadi.ac.in   E-mail: jnc.wadi@rediffmail.com   Phone: (07104) 220963

Date: 10/09/2024

This document hereby confirms that the data enclosed, comprising information, supporting documents, numerical data, and reports, has been thoroughly examined and authenticated by both the IQAC and the Principal, and is deemed accurate.

Convenor
(IQAC)
JN. Arts, Comm. & Sci. College
Wadi, Nagpur

Principal
Jawaharlal Nehru Arts, Comm. & Sci.
College, Wadi, Nagpur

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॥ विद्या परम् दैवतम् ॥

VSPM
Education Is Life

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B.A. PROGRAM OUTCOME & COURSE OUTCOME

The college is affiliated with R.T.M. Nagpur University and adheres to the books and syllabus prescribed by the university. It offers programs in B.A., B.Com., B.Sc., B.C.C.A., M.Com., M.Sc. (Chemistry), M.Sc. (Zoology), M.Sc. (Computer Science), M.A. (Marathi), M.A. (English), and M.A. (Sociology).

Programme Outcomes and Course Outcomes
Faculty of Humanities

Bachelor of Arts (B. A.)

The B.A. program is designed to equip students for careers related to the disciplines encompassed in the B.A. degree. It aims to foster the holistic development of students, enhancing their personalities and preparing them to contribute meaningfully and substantially to society. Through a blend of curricular and extracurricular activities, the program helps students develop effective communication skills and a comprehensive understanding of social, cultural, economic, and political issues that shape life.

Program Outcomes of Bachelor of Arts:

- **Develop Awareness:** Cultivate ideas that are relevant and responsive to the contemporary world.
- **Knowledge Competence:** Empower students to examine, create, and assimilate knowledge effectively.
- **Analytical Skills:** Enhance the ability to classify, comprehend, and evaluate information critically.
- **Broad Perspective:** Expand students' understanding of political, social, technological, and economic contexts within the humanities.

- **Teamwork and Independence:** Enable students to work independently or collaboratively to achieve goals.
- **Creative Expression:** Encourage the inner creative ability to reflect humanity in various aspects of life.
- **Enhanced Communication:** Strengthen communicative skills to attain expertise in chosen subjects.
- **Critical Analysis:** Build the capacity to analyze and establish facts in relation to social, economic, and political assumptions.
- **Critical Thinking:** Foster critical thinking and analysis of societal issues.
- **Value-Driven:** Instill human values and a sense of social service.
- **Good Citizenship:** Prepare students to become responsible and engaged citizens.

The B.A. program offers the following subjects:

English, English Literature, Marathi, Marathi Literature, Hindi, Economics, Sociology, Political Science, History, and Geography. Each subject provides students with unique insights and skills, contributing to their overall intellectual growth and career readiness.

Subject Overview:

- **English and English Literature:**

  English is a global language, widely used in media, technology, and communication. It opens windows to the world and offers vast learning resources. Mastery of English enhances job opportunities. Studying English Literature broadens understanding of diverse cultures, fosters empathy, and enriches perspectives.

- **Marathi and Marathi Literature:**

  Marathi, the regional and official language of Maharashtra, reflects the state's rich cultural heritage. Maharashtra, known as the land of saints, offers profound life philosophies. Learning Marathi enables students to explore region-specific history, culture, geography, and biodiversity. Marathi Literature provides wisdom through the works of poets, thinkers, and philosophers.

- **Hindi**:

  Studying Hindi allows students to understand its significance in the contemporary world. It offers insights into the contributions of renowned authors to Hindi literature and fosters a deeper appreciation for the language.

- **Economics**:

  Economics explores the production, distribution, and consumption of goods and services. Students learn how individuals, businesses, governments, and nations allocate resources, equipping them to analyze and address economic challenges.

- **Sociology**:

  Sociology examines social life, change, and the causes and consequences of human behavior. Students gain insights into group dynamics, organizational structures, societal interactions, and the methodologies sociologists use to study these phenomena.

- **Political Science:**

  Political Science involves the scientific study of politics, governance systems, and power structures. Students analyze political activities, thoughts, behaviors, constitutions, and laws, fostering a deeper understanding of political systems and processes.

- **History**:

  History connects students with past events and their impact on the present. It involves the discovery, organization, presentation, and interpretation of historical information, cultivating critical thinking and a sense of heritage.

- **Geography**:

  Geography helps students understand fundamental geographical concepts and their application in daily life. It offers systematic knowledge to analyze current issues, find solutions, and appreciate the relevance of geography in understanding global and local phenomena

ENGLISH

Course Objectives:

1. To develop students' proficiency in using English language skills effectively in listening, speaking, reading, and writing.

2. To systematically enhance students' ability to write and speak English fluently and appropriately in various situations.
3. To refine students' speech and writing styles, equipping them with tools for effective communication.
4. To expose learners to quality prose and poetry, fostering value-based ideas and cultural understanding.
5. To improve students' language skills, focusing on grammar and pronunciation for better articulation and comprehension.

Course Outcomes:

1. Upon completing the course, students will be able to read and comprehend texts in English and actively engage with classroom discussions and instructions.
2. The course helps students internalize language rules and develop the ability to analyze and apply language structures and usage naturally.
3. Students will gain proficiency in writing coherent paragraphs, essays, and formal letters with clarity and purpose.
4. Learners will acquire the skills to understand the mechanics of the English language and utilize them effectively in competitive exams and professional communication.

ENGLISH LITERATURE

Course Objectives:

1. To foster creativity and practical application of the English language through the study of literature and cultural studies.
2. To enhance learners' creative and critical thinking skills, essential attributes in todays globalized world.
3. To support the development of intellectual flexibility, creativity, and cultural awareness, enabling students to pursue lifelong learning.
4. To introduce students to representative literary and cultural texts across a broad range of historical, geographical, and cultural contexts.
5. To equip students with the ability to apply critical thinking and theoretical frameworks to analyze literary and cultural texts across multiple genres.

6. To enable students to produce analytical writing in various formats, including essays, research papers, reflective pieces, and critical reviews of secondary sources.

Course Outcome:

1. Students will develop creative writing skills, influenced by their exposure to diverse literary and cultural concepts.
2. They will be better prepared to face global challenges with enhanced intellectual flexibility, creativity, and an understanding of cultural nuances.
3. Students will gain comprehensive knowledge of representative literary and cultural texts, spanning significant historical, geographical, and cultural contexts.
4. They will acquire proficiency in writing essays, research papers, reflective pieces, and critical reviews.
5. Students will learn to critically analyze and appreciate human experiences as depicted in literary representations.

MARATHI

उद्दिष्टे (Objective):

1. विद्यार्थ्यांना मराठी भाषेचे मूलभूत ज्ञान आणि वापर शिकवणे.
2. मराठी भाषेतील संवाद कौशल्ये, लेखन कौशल्ये आणि वाचन कौशल्ये सुधारण्यासाठी विद्यार्थ्यांना सक्षम करणे.
3. मराठी भाषेचा इतिहास, साहित्य, संस्कृती आणि विविध पारंपरिक तत्वज्ञानांचा अभ्यास करून विद्यार्थ्यांना मराठी भाषा आणि साहित्याबद्दल सखोल माहिती देणे.
4. विद्यार्थ्यांच्या सृजनशीलतेला चालना देणे आणि त्यांना मराठी साहित्याच्या विविध रूपांतून सुसंस्कृत विचार विकसित करण्यास मदत करणे.
5. विद्यार्थ्यांना समाजातील सामाजिक, सांस्कृतिक, आणि ऐतिहासिक घटकांचा समज देऊन, मराठी भाषेचा वापर त्यांच्या रोजच्या जीवनात प्रभावीपणे करण्याची क्षमता निर्माण करणे.

कोर्स परिणाम (Course Outcome):

1. विद्यार्थ्यांना मराठी भाषेतील संवाद कौशल्ये व लेखन कौशल्ये विकसित होईल, ज्यामुळे ते विविध सामाजिक आणि व्यावसायिक संदर्भात प्रभावीपणे संवाद साधू शकतील.

2. विद्यार्थी मराठी साहित्याच्या विविध शैल्या, काव्य, कथा, निबंध, आणि नाटकांचा अभ्यास करून त्यांचा सांस्कृतिक समज वाढवू शकतील.

3. विद्यार्थ्यांना मराठी भाषेतील ऐतिहासिक आणि सामाजिक पार्श्वभूमीच्या समजातून साहित्याचा सखोल अभ्यास करता येईल.

4. विद्यार्थ्यांना मराठी भाषेच्या वापरात आत्मविश्वास मिळेल आणि ते समाजातील विविध गटांशी प्रभावी संवाद साधू शकतील.

5. विद्यार्थ्यांना मराठी भाषेतील शास्त्रीय आणि सृजनशील लेखनाच्या पद्धती शिकवून, त्यांचा सृजनशील विचार वाचक व श्रोत्यांपर्यंत पोहचवता येईल.

MARATHI LITERATURE

उद्दिष्टे (Objective):

1. विद्यार्थ्यांना मराठी साहित्याचे विविध प्रकार आणि त्याच्या ऐतिहासिक विकासाची माहिती देणे.

2. मराठी साहित्याच्या प्रमुख कवीं, लेखक, आणि काव्यशास्त्रज्ञांच्या विचारधारांचा अभ्यास करून विद्यार्थ्यांना साहित्याची गहरी समज देणे.

3. विद्यार्थ्यांना मराठी साहित्याच्या विविध प्रकारांमध्ये (काव्य, कथा, निबंध, नाटक इ.) सृजनशील विचार आणि लेखन कौशल्यांचा विकास करण्यासाठी प्रेरित करणे.

4. साहित्याचा अभ्यास करतांना विद्यार्थ्यांमध्ये सांस्कृतिक आणि ऐतिहासिक परंपरांचा आदर आणि समज विकसित करणे.

5. मराठी भाषेतील साहित्यिक धारेचे महत्त्व विद्यार्थ्यांना समजावून देणे आणि त्यांचे लेखन, वाचन आणि विचार प्रक्रियेतील कौशल्ये सुधारणा करणे.

कोर्स परिणाम (Course Outcome):

1. विद्यार्थी मराठी साहित्याच्या प्रमुख लेखकांचा आणि काव्यशास्त्रज्ञांचा सखोल अभ्यास करून साहित्यिक दृष्टिकोन विकसीत करू शकतील.

2. विद्यार्थ्यांना मराठी साहित्याच्या विविध प्रकारांची, शैलींची आणि विचारधारांची समज होईल, ज्यामुळे त्यांचे सृजनशील लेखन आणि वाचन कौशल्ये सुधारतील.

3. विद्यार्थी मराठी साहित्याच्या ऐतिहासिक संदर्भातील विविध काव्य, कथा आणि निबंधांचा योग्य विश्लेषण करून, त्यांना साहित्याचे सामाजिक, सांस्कृतिक आणि ऐतिहासिक महत्त्व कळेल.

4. विद्यार्थ्यांना साहित्यिक विचार करण्याची क्षमता प्राप्त होईल, ज्यामुळे ते समाजातील विविध मुद्द्यांवर विचार करू शकतील आणि त्यावर प्रभावीपणे चर्चा करू शकतील.

5. विद्यार्थी मराठी साहित्याच्या लेखनाची समज घेत, त्यांचा साहित्यिक दृष्टिकोन अधिक सुसंस्कृत आणि विचारशील बनवू शकतील.

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HINDI

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उद्देश्य (Objective):

1- इस पाठ्यक्रम का उद्देश्य विद्यार्थियों में हिन्दी भाषा की विविध अवधारणाओं, सिद्धांतों, चिंतन परंपराओं का बोध कराना तथा विद्यार्थियों में आकलन की क्षमता का विकास करना है।

2- हिन्दी भाषा के इतिहास, भाषा की जानकारी, रोजगार की संभावनाएं, भाषा के अध्ययन तथा विश्लेषण से विद्यार्थियों में हिन्दी भाषा के प्रति जिज्ञासा तथा विश्लेषणात्मक दृष्टिकोण का विकास करना है।

3- सामाजिक परंपराओं, मान्यताओं और सामाजिक चुनौतियों का भाषा के माध्यम से परिचय करवाना।

4- विद्यार्थियों में शोध, विश्लेषण एवं मूल्यांकनपरक दृष्टिकोण विकसित करना।

पाठ्यक्रम प्रतिफलन [Course Learning Outcomes]

1- इस पाठ्यक्रम से विद्यार्थी में कौशल परक का निर्माण होगा।

2- शोध की संभावना बढ़ेगी तथा अनवेषणात्मक वृत्ति का निर्माण होगा।

3- सम्प्रेषण क्षमता विकसित होगी।

4- भाषा की समझ से सामुदायिक भावना तथा सहयोगी वृत्ति विकसित होगी।

5- रोजगार के विविध आयामों की जानकारी मिलेगी।

6- मानवीय मूल्यों की समझ निर्माण होगी।

7- अध्यापन, मीडिया, अनुवाद, सरकारी कार्यालय आदि क्षेत्रों में रोजगार की संभावनाएं बढ़ेगी।

ECONOMICS

Course Objectives – Economics

1. To provide students with a foundational understanding of economic principles, including production, distribution, and consumption of goods and services.
2. To develop students' ability to analyze and interpret economic data and trends.
3. To enable students to understand how economic theories apply to real-world situations, including business, government, and international relations.
4. To equip students with the skills to make informed decisions on economic issues and policies.
5. To cultivate an awareness of global economic challenges, such as poverty, inequality, and sustainable development.

Course Outcomes – Economics

1. Students will demonstrate an understanding of key economic concepts, such as supply and demand, market structures, and the role of government in the economy.
2. They will develop analytical skills to interpret economic data, identify trends, and make informed decisions.
3. Students will be able to apply economic theories and principles to real-world issues, including business strategies, public policies, and international trade.
4. They will acquire the ability to critically assess economic problems and propose solutions based on sound economic reasoning.
5. Students will gain an understanding of global economic challenges and be prepared to contribute to discussions on issues like poverty, inequality, and sustainable development.

SOCIOLOGY

Course Objectives – Sociology

1. To introduce students to the fundamental concepts, theories, and methods in sociology.

2. To help students understand the structure and functioning of societies, including social institutions, relationships, and behavior patterns.

3. To develop students' ability to analyze social issues, such as inequality, gender, race, and social change.

4. To foster an understanding of how social forces influence individuals, groups, and communities.

5. To encourage students to think critically about the social world and to develop skills for evaluating and addressing social problems.

Course Outcomes – Sociology

1. Students will have a strong understanding of core sociological concepts, theories, and research methods.

2. They will be able to analyze the structure and dynamics of societies, including key social institutions like family, education, and the economy.

3. Students will develop the ability to critically assess and discuss contemporary social issues such as inequality, social justice, and the effects of globalization.

4. They will gain an understanding of how individuals' behavior is shaped by social influences and how societal changes impact social norms and values.

5. Students will be able to apply sociological knowledge to real-world social problems, using a critical, evidence-based approach to propose solutions.

POLITICAL SCIENCE

Course Objective:

1. To help students understand basic ideas, concepts, approaches, and perspectives in political science, including democratic and other systems of governance.

2. To familiarize students with new ideas, trends, and developments in the field of political science.

3. To encourage students to connect political science with other disciplines, fostering an interdisciplinary understanding.

4. To develop students' analytical abilities to critically assess political structures, policies, and events.

After completing this course, students will be able to:

1. Understand the nature and significance of Political Theory.
2. Grasp key political concepts such as power, authority, rights, liberty, equality, and justice, and their relevance in contemporary political situations.
3. Gain insight into the political ideas, views, and concerns of leading Indian thinkers.
4. Develop an understanding of the contributions of Indian political and social thinkers to the development of political thought.
5. Draw positive inspiration from the philosophies of great thinkers to apply in real-world contexts.
6. Enhance their understanding of the fundamental concepts of Indian Political Thought, enabling deeper analysis of political systems and ideologies.

HISTORY

Course Objective:

1. To provide students with an understanding of the historical background of our past, including religion, customs, institutions, and administration.
2. To create awareness about the social, political, religious, and economic conditions of people in various historical periods.
3. To encourage a comparative approach in studying world history.
4. To develop students' analytical skills to connect historical events with contemporary issues, highlighting their relevance to the present.
5. To foster critical thinking in historical writing, discussions, and interpretations.

Course Outcomes – History

1. Students will gain a comprehensive understanding of the historical background of societies, including their religion, customs, institutions, and administrative systems.
2. They will develop the ability to analyze and interpret social, political, religious, and economic conditions of people in historical contexts.

3. Learners will acquire a global perspective by studying world history through a comparative approach.
4. Students will enhance their analytical skills to draw connections between past events and contemporary issues, understanding their relevance in modern times.
5. They will develop critical thinking abilities in historical research, discussion, and interpretation, enabling them to form well-rounded, evidence-based conclusions.

GEOGRAPHY

Course Objectives:

1. Gain an understanding of fundamental geographical concepts, including spatial relationships and the concept of scale.
2. Analyze the dynamic interactions between human societies and the natural environment.
3. Explore global patterns of population distribution, urbanization, and economic development.
4. Develop proficiency in map reading, spatial analysis, and critical thinking to address geographic issues effectively.

Course Outcomes:

1. Demonstrate an understanding of fundamental geographic concepts, including location, place, and region.
2. Apply geographic methods and tools to analyze spatial patterns and processes effectively.
3. Evaluate the reciprocal impact of human activities on the physical environment and the environment's influence on human activities.
4. Critically assess global issues such as sustainability, cultural diversity, and economic development from a geographic perspective.

Master of Arts (M. A.) English

Objectives:

1. To introduce England from the late fourteen century to endeavoring of blending the spirit of the Renaissance and the Restoration.
2. To give an account of the development of poetry and its different forms.
3. To introduce students to the golden age of English drama and its evolution from the Middle Ages.
4. To explore the development and evolution of the English novel.
5. To cover the origin of English prose and to understand its growth through medieval romances.
6. To understand the concept of the global literature.
7. To understand socio-cultural aspects in Dalit Literature.

Course Outcomes: Students will be able to understand

1. Different forms of poetry developed taking English poetry on the path of Modernization.
2. The reason behind the undercurrents of upheavals prevalent leading to the generation of a progressive spirit affecting poetry.
3. Students will be able to compare and contrast restoration, neo-classical and romantic revival literature.
4. The students will come to know about the beginning of English drama and what role did the initial contributors play to give this well-developed English theatre.
5. The students will be able to understand the socio-economic, cultural context of the English novels.
6. Students will be able to understand different varieties of prose.
7. Students will know about the themes and issues dealt with by Asian writers.
8. Students will learn the basics of application –based research in Dalit studies.

Master of Arts (M. A.) Marathi

उद्दिष्टे (Objectives)

1. विद्यार्थ्यांना मराठी साहित्याच्या सखोल आणि सुस्पष्ट ज्ञानाची प्राप्ती करणे.

2. मराठी साहित्याच्या ऐतिहासिक, सांस्कृतिक, आणि सामाजिक संदर्भांचा अभ्यास करून त्यांचे व्यापक समज निर्माण करणे.

3. साहित्यिक विश्लेषण आणि समालोचन कौशल्ये विकसित करणे, जे विद्यार्थ्यांना साहित्यिक कार्यावर गहन दृष्टिकोनातून विचार करण्यास मदत करतील.

4. साहित्याच्या विविध शैलिंमध्ये (काव्य, कथा, निबंध, नाटक, इ.) सृजनशीलता आणि शोध क्षमता वाढवणे.

5. विद्यार्थ्यांना साहित्यिक लेखन व संशोधनाच्या क्षेत्रात तज्ज्ञ बनवणे आणि त्यांना सशक्त लेखन कौशल्य विकसित करण्यासाठी प्रेरित करणे.

6. मराठी साहित्याच्या प्रमुख लेखकांबद्दल सखोल माहिती देऊन, त्यांच्या विचारांची आणि कार्याची कदर करण्यास विद्यार्थ्यांना सक्षम करणे.

7. मराठी साहित्याच्या संस्कृतीतील बदल, समाजातील विद्यमान स्थिती, आणि साहित्याच्या प्रभावांचा सखोल अभ्यास करणे.

8. विद्यार्थ्यांना विद्यार्थिक, सामाजिक, आणि सांस्कृतिक अशा विविध संदर्भांमध्ये साहित्याचे महत्त्व आणि स्थान समजावून देणे.

कोर्स परिणाम (Course Outcomes):

1. विद्यार्थ्यांना मराठी साहित्याच्या विविध शैलिंमध्ये सखोल वाचन, लेखन आणि समालोचन कौशल्ये प्राप्त होतील.

2. विद्यार्थी मराठी साहित्याच्या ऐतिहासिक आणि सामाजिक संदर्भात विश्लेषणात्मक विचारसरणी विकसित करू शकतील.

3. विद्यार्थ्यांना साहित्यिक दृष्टिकोनातून विविध सामाजिक व सांस्कृतिक मुद्द्यांवर विचार करण्याची क्षमता मिळेल.

4. ते मराठी साहित्याचे विद्यार्थिक आणि सांस्कृतिक महत्त्व अधिक चांगल्या प्रकारे समजू शकतील.

5. विद्यार्थ्यांचे साहित्यिक विचार अधिक सुसंस्कृत व सृजनशील बनतील, आणि ते सशक्त लेखक म्हणून उभे राहतील.

6. विद्यार्थी साहित्यिक कार्यावर गहन व सुसंगत विश्लेषण करून त्यांच्यावर विद्यार्थिक निबंध, शोधप्रबंध आणि शोधनिबंध लिहू शकतील.

7. विद्यार्थी साहित्याच्या विकासात आणि बदलामध्ये मोलाची भूमिका बजावणारे प्रमुख लेखक, विचारक, आणि काव्यशास्त्रज्ञ यांची आदरपूर्वक माहिती ठेवू शकतील.

8. विद्यार्थ्यांना सृजनशील लेखन आणि संशोधनाच्या क्षेत्रात एक प्रगल्भ दृष्टिकोन मिळवून ते विद्यार्थिक आणि साहित्यिक क्षेत्रात उच्च स्थान प्राप्त करू शकतील.

Master of Arts (M. A.) Sociology

Objectives

1. To provide students with an in-depth understanding of sociological theories, concepts, and methodologies.

2. To encourage critical thinking and analytical skills, enabling students to analyze social structures, institutions, and processes.

3. To foster a comprehensive understanding of the relationships between individuals and society, and the influence of social, economic, and political factors on human behavior.

4. To equip students with the tools necessary for conducting sociological research and fieldwork, with an emphasis on data collection and analysis.

5. To enhance the ability of students to assess and interpret various social issues such as inequality, gender, education, urbanization, and globalization.

6. To familiarize students with major social movements, ideologies, and changes that have shaped societies historically and in contemporary times.

7. To cultivate a sense of social responsibility and an understanding of social justice, encouraging students to contribute to societal development.

8. To prepare students for professional roles in social research, policy-making, and community development, among other related fields.

1. Students will develop a strong understanding of key sociological theories and concepts, enabling them to analyze social phenomena critically.
2. They will be able to conduct independent research and fieldwork, applying sociological methods to real-world problems.
3. Students will acquire the skills to evaluate social issues and their impact on individuals and communities from a sociological perspective.
4. They will be able to analyze the relationship between social institutions, such as family, education, and government, and their role in shaping individual and collective behavior.
5. Students will understand the influence of global and local social forces, including economic and political dynamics, on societal trends and issues.
6. They will develop a deeper understanding of social justice and human rights issues, motivating them to work towards the betterment of society.
7. Students will gain expertise in writing research papers, conducting qualitative and quantitative analysis, and contributing to academic discussions in sociology.
8. Graduates will be well-equipped for careers in social research, policy-making, community development, and related fields, with a strong foundation in sociological thought and practice.

B.SC. PROGRAM OUTCOME & COURSE OUTCOME

Program Outcomes, Program Specific Outcomes and Course Outcomes

Faculty of Science

Bachelor of Science (B.Sc.)

A Bachelor of Science (B.Sc.) program typically leads to various learning outcomes that equip graduates with both specific knowledge in their chosen field and broader skills applicable in many areas. B.Sc. program aims to produce graduates who are well-prepared for professional careers or further education, equipped with technical expertise, problem-solving abilities, and essential transferable skills.

The outcomes focus on academic knowledge, practical experience, and the development of intellectual and personal attributes that contribute to success in both the workforce and in higher studies. These outcomes can vary depending on the discipline (e.g., Botany, Chemistry, Mathematics, Physics, Computer Science, Zoology etc.).

Program Outcome of Bachelor of Science

1. Subject-Specific Knowledge and Understanding

- **Core Concepts:** Graduates gain a deep understanding of fundamental principles, theories, and practices within their chosen field of study.

- **Specialized Knowledge:** Depending on the area of study, students acquire specialized knowledge that prepares them for entry-level professional roles or further education (e.g., postgraduate studies).

2. Critical Thinking and Problem-Solving Skills

- **Analytical Thinking:** Graduates develop the ability to approach complex problems systematically and critically.

- **Scientific Method:** In science-based disciplines, students learn to use observation, experimentation, and reasoning to form hypotheses and draw conclusions.

- **Application of Theory to Practice:** The ability to apply theoretical concepts to real-world situations and problems.

3. Research and Inquiry Skills

- **Conducting Research:** Students gain proficiency in researching, collecting, and analyzing data. This includes designing experiments or surveys, interpreting results, and presenting findings.

- **Evidence-Based Reasoning:** Graduates are trained to make informed decisions based on evidence and research, ensuring that they can contribute to advancements in their field.

4. Communication Skills

- **Written Communication:** B.Sc. graduates are skilled at writing research papers, reports, or essays that communicate complex scientific concepts in a clear and logical manner.

- **Oral Communication:** Graduates learn to effectively present their ideas and findings in meetings, conferences, or classroom settings.

- **Interpersonal Communication:** The ability to collaborate and engage with peers, colleagues, and professionals in academic or industry environments.

5. Technical and Practical Skills

- **Laboratory Skills:** In many scientific disciplines, students develop hands-on skills in lab settings, which may include the use of specialized equipment and technologies.

- **Software and Tools:** In fields like Computer Science or Data Science, students gain proficiency in relevant software, coding languages, and tools essential for their field.

- **Professional Techniques:** Depending on the program, students might also learn specific techniques relevant to their area of expertise, such as statistical analysis, modeling, or simulation.

6. Ethical and Social Responsibility

- **Ethical Decision-Making:** Graduates understand ethical issues within their field, whether they relate to research integrity, environmental concerns, or the impact of technology on society.

- **Sustainability and Global Awareness:** Students may develop an understanding of how their work affects the environment, society, and future generations, with a focus on sustainable practices in science and technology.

7. Independent Learning and Self-Management

- **Time Management and Organization:** Graduates are equipped to manage their time effectively, balancing coursework, research and other commitments.

- **Self-Directed Learning:** The ability to continue learning independently after graduation, staying up to date with advances in the field.

8. Collaboration and Teamwork

- **Group Work:** Students work in teams on projects or research, learning to collaborate, share ideas, and contribute to collective problem-solving efforts.

- **Interdisciplinary Collaboration:** In some cases, students learn to work across disciplines, integrating knowledge from different fields to solve complex problems.

9. Career Readiness and Professionalism

- **Career Skills:** Graduates are prepared for entry into the work force with skills such as problem-solving, analytical thinking, and effective communication.

- **Networking:** Students may have opportunities to build professional relationships, connect with alumni, or attend industry-related events.

- **Workplace Professionalism:** Understanding work place culture, ethical responsibilities, and professional conduct.

10. Preparation for Further Study

- **Graduate Education:** The B.Sc. program often provides the foundational knowledge and skills necessary for further academic pursuits, such as Master's or Doctoral programs in the field.

Course Outcome of Bachelor of Science

A Bachelor of Science (B.Sc.) degree typically leads to a broad range of career outcomes, depending on the specific field of study. The outcomes can vary significantly between different disciplines, but in general, completing a B.Sc. program equips graduates with foundational knowledge and practical skills that are highly valued across multiple industries. Below is an overview of potential career outcomes for various subjects in B.Sc. degree course such as Botany, Chemistry and Computer Science, Mathematics, Physics and Zoology.

Botany - Concentrate on study of Plants life including plant anatomy, physiology, taxonomy, genetics and ecology.

Content of the course - Subjects include plant morphology, plant biotechnology, ecology, economic botany and photochemistry.

Skills Acquired - Students acquire skills in laboratory techniques, fieldwork, plant identification and research methodologies. This course prepares them for careers in plants research, environmental consulting, agriculture, or further studies in plant sciences.

Chemistry - Students focus on the study of matter and its properties, chemical reactions, and the applications of chemistry in various industries.

Content of the Course - Core are include organic, inorganic, physical and analytical chemistry, as well as biochemistry and environmental chemistry.

Skills Acquired - Graduate students become proficient in laboratory techniques, chemical analysis and safety protocols. The course prepares students for careers in pharmaceuticals, research and industrial chemistry, environmental science and further studies in chemistry.

Computer Science - Students focus on the computer systems, programming, software development, data science, and technology applications.

Mathematics - Students concentrate on the study of mathematical theories, analytical methods, and problems-solving skills across various fields.

Content of the course - Key topics include calculus, algebra, differential equations, statistics, linear algebra, and mathematical modeling.

Skills Acquired - Students developed strong analytical and logical reasoning abilities. Career paths include data analysis, software development, and postgraduate studies in mathematics.

Physics - Focus of the students on study of matter, energy and the fundamentals laws governing the universe.

Content of the course - Major area include classical mechanics, thermodynamics, quantum mechanics, optics, electromagnetism and nuclear physics.

Skills Acquired - Graduate gains skills in experimental physics, mathematical modelling, and data analysis. Career opportunities are available in research, engineering, aerospace, electronics teaching and post-graduation in physics.

Zoology – Focus on the study of animal biology, anatomy, physiology, genetics, evolution and ecology.

Content of the course - It includes cellular biology, animal physiology, taxonomy, environmental science, and conservation biology.

Skills Acquired - Students gain expertise in lab techniques, field research, and ecological analysis. Graduates are prepared for roles in wildlife conservation, environmental science and biological research and for advanced studies.

Each B.Sc. program offers specialized training that combines theoretical knowledge with hands-on skills, tailored to its scientific field. Students gain problem-solving analytical and practical skills that prepare them for arrange of careers or further studies. These courses provide a strong foundation for both technical roles and advanced research in their respective disciplines.

M.SC. PROGRAM OUTCOME & COURSE OUTCOME

Program Outcomes, Program Specific Outcomes & Course Outcomes: M.Sc. Chemistry

PSO1: Chemistry Knowledge: Possess knowledge and comprehension of the core and basic knowledge associated with the profession of chemistry, including specialized areas of inorganic chemistry, organic chemistry, physical chemistry, analytical chemistry, and elective subjects of nuclear chemistry, medicinal chemistry, polymer chemistry and environmental chemistry.

PSO2: Problem analysis and Modern tool usage: Utilize the principles of scientific enquiry, thinking analytically, clearly and critically, while solving problems. Find, analyze, evaluate and apply information system practically. Learn, select, and apply appropriate methods and procedures resources, and modern chemistry-related to computing tools with an understanding of the limitations.

PSO3: Environment and sustainability: Understand the impact of the professional chemistry solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development

PSO4: Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change. Self- access and use feedback effectively from others to identify learn in needs and to satisfy these needs on an ongoing basis

PSO5: Leadership skills: Understand and consider the human reaction to change, motivation issues, leadership and teambuilding when planning changes required for fulfillment of practice, professional and societal responsibilities. Assume participatory role as responsible citizens or leadership role appropriate to facilitate improvement in heath and well beings.

PSO6: Professional Identity: Understand, analyze and communicate the value of the in professional roles in society (e.g. environmental professionals, analytical professionals, educators, researchers, employers, employees).

PSO7: Communication: Communicate effectively with the society at large, such as, being able to comprehend and write effective reports, make effective presentations and documentation, and give and receive clear instructions.

Course Outcomes: Master of Science (Chemistry) M.Sc. Semester-I

Course name: Inorganic Chemistry (CH-1T1)

CO1: Student able to predict the geometry of individual molecules or complexes

CO2: Student able to understand the complex formation equilibria in solution and to know unusual methods to the study of reaction rates.

CO3: Student informed with boron hydrides, or polyboranes which are the original cluster compounds as well as the first known family of electron-deficient compounds.

CO4: Student able to study of clustering of metal atoms.

Course name: Organic Chemistry (CII-lT2)

CO1: Be able to understand the applicability of concepts like delocalized bonding, conjugation, cross conjugation, resonance, in various carbon containing COM and develop the understanding of the reactive intermediates.

CO2: Be able to study optical activity in compounds without chirality and analyse stereo-chemical aspects involved in various compounds and the corresponding chemical reactions.

CO3: Be able to reactions and understand mechanisms of various substitution nucleo-phillic reaction and get basic knowledge about the anchimcric assistance and isotope effects

CO4: Be able to understand mechanisms of various Aromatic nucleophillic and electro-phillic substitution reactions and get acquainted with associated outcomes like resonance, field, steric effects & its quantitative treatment.

Course name: Physical Chemistry (CH-lT3)

CO1: Get acquainted with various laws of thermionics and its applications.

CO2: Be able to understand partial molar quantities, its determination and reduced phase rule in various comenttems

CO3: Be able to recapitulation of terms of surface tension and different adsorption isotherms and be able to validate the newly developed analytical method as rvcll as rted methods

CO4: Able to propose some new methods or modify existing methods of qualitative and quantitative analysis

Course name: Analytical Chemistry (CH-lT4)

CO1: Get acquainted with various terminology and fundamentals of analytical chcrris including classical and instrumental methods.

CO2: Be able to explain analytical techniques in terms of the working principles of volumetry, and gravimetry

CO3: Able to propose some new methods or modify existing methods of qualitative and quantitative analysis.

Course name: Practical Inorganic Chemistry (CH- 1P1)

CO: Be able to understand the basic principles involved in separation and estimation of acidic and basic radicals and be able to apply the knowledge in real sample analysis for quantitative estimation as well as qualitative detection and also be able to assign a numerical value to variables by the quantitative analysts is to reflect reality mathematically.

Course name: Practical Physical Chemistry (CH-1P2)

CO: Be able to understand the principles of physical chemistry and interpret them through small experimental performances.

Course name: Seminar (1Sl)

CO: On completion of seminar, the student will be in a position to present the topic in front of subject audience that will enhance confidence level and lead to personality development.

Course Outcomes: Master of Science (Chemistry) M.Sc. Semester-II

Course name: Inorganic Chemistry (CH-2T1)

CO1: Will be able to understand the origin of colors in the complexes and their magnetic behavior.
CO2: Develop ability to understand various reactions of transition metal complexes.
CO3: Will know the concept of bonding in various metal carbonyls.
CO4: Will be able know chemistry behind the metal nitrosyl.

Course name: Organic Chemistry (CH-2T2)

CO1: Be able to acquire the knowledge and understand applicability of carbon carbon multiple bond and carbon hetero atom multiple bond, addition reaction and develop understanding of reaction mechanism in metal hydride reaction.
CO2: Be able to analyze various mechanism of molecular rearrangement and concept of elimination reaction

CO3: Be able to understand free radical reaction.
CO4: Be able to comprehend various aspects of green chemistry.

Course name: Physical Chemistry (CH-2T3)

CO1: Be able to understand the Eigen value and Eigen function and application of Schrodinger wave function to various systems.
CO2: Be able to determine the activity coefficients and ionic strength.
CO3: Able to identify symmetry in crystals.
CO4: Get the knowledge about various statistics and understand and working of different counters.

Course name: Analytical Chemistry (CH-2T4)

CO1: Be able to understand the working, principle and techniques involved in methods of analysis
CO2: Be able to explain the advantages of modern methods over the classical ones.
CO3: Apply the principles of spectroscopic techniques in the quantitative and qualitative analysis of various samples.
CO4: Be able to develop their own methods of quantitative analysis of metalions using instrumental methods

Course name: Practical Organic Chemistry (CH-2P1)

CO: Be able to perform the quantitative analysis of organic binary mixture and able to get hands on training for the synthesis of commercially important organic compounds (single and two stage organic reaction).

Course name: Practical Analytical Chemistry (CH-2P2)

CO: Get expertise in titrimetric analysis based on neutralization, precipitation, redox, and complexometric analysis, gravimetric estimation of barium and calcium, separation technique of paper chromatography and electro analytical techniques as potentiometry, conductometry and optical method like colorimetery.

Course name: Seminar (CH-2S1)

CO: On completion of seminar, the student will have an improved knowledge about the subject and will be in a position to present the topic more confidently.

Course Outcomes: Master of Science (Chemistry) M.Sc. Semester-III
Course name: Organic Chemistry Special Paper I (CH-3T1)

CO1: Be able to explain what happen when organic molecule are excited by irradiation and be capable to discuss the photochemistry in nature and in various photochemical reaction.
CO2: Pericyclic reaction is used in very vast way in nature and also by organic chemist. This course gives the students the theoretical basis of this kind of reaction and also helps them to find a way to carry out these types of reaction.
CO3: Get well versed with the various oxidation and reducing agents and the stereo chemical aspects involved in various chemical reactions.
CO4: Acquire knowledge about the chemistry of compounds of phosphorus and sulfur and their application of organoboranes and organosilicon compounds in organic synthesis.

Course name: Organic Chemistry Special Paper II (CH-3T2)

CO1: Be able to acquire knowledge about terpenoids and porphyrines, the stereochemistry involved along with the structure determination and synthesis of some representative molecules.
CO2: Be able to build learning about alkanoids, the stereochemistry involved along with structure determination and acquire brief idea about prostaglands.
CO3: Be able to develop understanding of steroid chemistry and plant pigments.
CO4: Be able to quantify the contribution of carbohydrates in nature and get as well versed with properties of amino acids, and structural features of polypeptides.

Course name: Medicinal Chemistry Elective Paper (CH-3T3)

CO1: Became acquainted with various terminology and fundamentals of drug designing including classical method for QSAR

CO2: Be able to study pharmacokinetics and pharmacodynamic aspects of drug metabolism and would be able to acquire knowledge and applicability of diuretic and the analgesic and antipyretic drugs.

CO3: Be able to get well versed either cardiovascular and antineoplastic agents and their applicability.

CO4: Able to develop comprehensive knowledge about various psycho activedrugs and anticoagulants.

Course name: Spectroscopy-I (core subject centric) Paper (CH-3T4)

CO1: Be able to understand symmetry elements and operations to organic and inorganic molecules

CO2: Learn the mass spectroscopy technique and will be able to identify the molecule on the basis of the fragmentation pattern in the mass spectrum and learn application of readio active molecules in Mossbauer Spectroscopy

CO3: Be able to understand energy changes at very lower level and capable of predicting the satellite pattern of geographical areas. ESR techniques used to determine the presence of unpaired electron especially in complexes

CO4: Elucidate the structure determination of organic molecules b IR spectroscopy, problem based on IR spectra

Course name: Practical Organic Chemistry Special I (CH-3P1)

CO: Be able to isolate natural product using fractional distillation, column chromatography and extraction method, get hands on the technique involved for the qualitative analysis of a mixture of three organic compounds and able to understand application of volumetry analysis in the estimation of organic analyze from given solutions

Course name: Practical Medicinal Chemistry Elective (CH-3P2)

CO: Be able to estimate the active ingredients of various pharmaceutical; compounds and get acquainted with the strategies involved the preparation of many organic and drug moieties.

Course name: Seminar (CH-3S1)

CO: On completion of seminar, the student will be able to consolidate idea about the subject and thereby develop knowledge about the subject will boost their confidence.

Course Outcomes: Master of Science (Chemistry) M.Sc. Semester-IV

Course name: Organic Chemistry Special Paper I (CH-4T1)

CO1: Be able to quantify the applicability of carbanion intermediate in organic synthesis.
CO2: Be able to understand organic synthesis using transition metals and organo metallic reagents.
CO3: Be able to be well familiar with the advance terminologies rules and concepts involved in stereochemistry and will have a deeper knowledge about the applicability of stereo chemical and the protection deprotection concepts.
CO4: The student will able to apply logic behind organic synthesis using retro synthesis approach

Course name: Organic Chemistry Special Paper II (CH-4T2)

CO1: Get acquainted with basic terminology involved in enzyme chemistry hich is important to understand several life processes
CO2: Come to know importance of heterocyclic compounds as a part of many natural product as well as pharmaceutical drugs
CO3: Be able to analyze structure of nucleic acid, lipids, peptides and vitamins which are important building blocks in living system
CO4: Be able to have brief idea about the terminologies and concepts involved in drugs, dyes and polymer chemistry

Course name: Medicinal Chemistry Elective Paper (CH-4T3)

CO1: Get acquainted with various terminology and fundamentals of drug rules and drug acts
CO2: Be able to study and analyze assorted chromatographic separation technique for drugs: TLC
CO3: Be able to know the concept of analytical and statistical sampling
CO4: Able to the chemistry of anti viral, anti-malarial, histamines and anti-histamic, antibiotics, anti-helmenthis, anti-amoebic and anti- inflammatory drugs.

Course name: Spectroscopy II (Core subject centric) Paper (CH-4T4)

CO 1: Be able to understand the theoretical aspects of UV, NMR and electron .
CO 2: Be able to identify various molecular excitations and calculation of wavelengths of absorption.
CO 3: Be able to elucidate the structure of molecule based on NMR spectra and be in a position to carry out the spectral analysis for structure determination.
CO 4: Comprehend the XRD data for crystal structure determination

Course name: Practical Organic Chemistry Special (CH-4P1)

CO: Be able to carry out elemental analysis of organic compounds, get experience in the estimation of biomolecules and some organic drug molecules. The students will get hands on training of multi-step preparation of small organic molecules and will develop ability to identify various known organic molecules using NMR, IR, Mass and U. V. spectra.

Course name: Project (CH-4P2)

CO: Learn how to carry out literature survey in a specific area of research, work on a small idea to develop their own observations, analyze the results obtained from the experiments carried out, validate the methods developed by him/her and develop an overall research attitude so that he can become a good researcher in future

Course name: Seminar (CH-4S1)

CO: After successful completion these four seminars assigned to them, they will be in a position to explain the concepts they learned from the dais in front of any number of audiences. This will lead to overall personality development of the student for entering into teaching profession.

Program Outcomes, Program Specific Outcomes & Course Outcomes: M.Sc. Computer Science

Program Outcomes

Name of Program: M.Sc. Computer Science

No. Of Courses: 30

Targeted Graduate Attributes: Disciplinary Knowledge, Critical Thinking, Problem Solving, Analytical Reasoning, Communication Skills, Teamwork, Moral and Ethical Awareness

	Program Outcomes
PSO1	The students will be able to develop aptitude to manifest a wide and extensive knowledge in the field of computer science.
PSO2	Ability to think critically for solving various problems and recent trends in computer softwares.
PSO3	The students will be capable of working effectively in diverse conditions as a team.
PSO4	The students will be able to develop skills in software design and its implementation.
PSO5	The students will be able to apply knowledge of computer science in academic and corporate sectors.
PSO6	The students will be able to develop self sustainability as well as competitiveness and employability.
PSO7	The students will be able to plan and write a research paper or proposal and assignment in computer science.

Program Matrix

Name of Program: M.Sc. (Computer Science)

(Low Correlation = L/1 ; Moderate Correlation = M/2 ; High Correlation = H/3)

	Course Outcomes (COs)	Program Outcomes (POs)						
		Domain Specific (PSO)				Domain Independent (PO)		
	Course Name: M.Sc.(Computer Science) - Semester I	1	2	3	4	5	6	7
	DISCRETE MATHEMATICAL STRUCTURE							
CO1	To able to specify and manipulate basic mathematical object	M	M	L	M	M	M	H
CO2	Very important to develop logic for the problem solving in the field of computer science.	H	H	M	H	M	M	H
CO3	Understand the basics of probability and number theory which is very important in problem solving.	M	H	M	H	M	M	H
CO4	Use effectively algebraic techniques to analyse basic discrete structures and algorithms	M	M	L	H	H	M	H
	PROGRAMMING IN JAVA							
CO1	Facilitates in understanding the concepts of object oriented programming	M	H	M	M	M	M	H
CO2	Effective to implement platform independence	H	H	H	H	H	H	H
CO3	Design Programs for RMI and JAVA Beans and Swings	H	M	M	M	H	H	H
CO4	Skill Enhancing through concepts like multithreading, abstraction , platform independence	H	H	H	H	H	H	H
	DIGITAL ELECTRONICS AND MICROPROCESSOR							
CO1	Learning to design various applications based on digital electronics	M	M	H	M	H	M	H
CO2	Developing assembly language programming skills	M	H	H	H	H	H	H
CO3	Learning to design various applications based on digital electronics	M	H	H	H	H	H	H

CO4	Developing assembly language programming skills	M	M	M	H	H	H	H
ADVANCED DBMS & ADMINISTRATION								
CO1	Can explore efficient method for handling multiple types of data	M	M	H	H	H	H	M
CO2	Have a detailed view of handling parallel and distributed database	M	M	M	H	H	H	H
CO3	Ability to normalize the database & understand the internal data structure	M	H	H	M	H	H	H
CO4	Deep visualization of realistic data into physical structure	M	H	H	H	H	H	H
PRACTICAL I								
CO1	Solve problems in theoretical computer science as it relies heavily on graphs and logic	M	H	H	H	M	M	H
C02	The students can imbibe the idea of proving programs correct through the use of discrete mathematic structure	M	H	M	M	M	M	H
C03	Useful in designing web and desktop applications	H	H	H	H	M	M	H
CO4	Design and program stand-alone Java Applications	H	H	M	H	M	M	H
PRACTICAL II								
CO1	Learning to design various applications based on digital electronics	M	H	H	M	H	H	H
CO2	Developing assembly language programming skills	H	H	H	H	H	H	H
CO3	Facilitates in creation of Data Structures and effective management of Database	H	H	H	H	H	H	H
CO4	Ability to normalize the database & understand the internal data structure	H	H	H	H	H	M	H
Course Name: M.Sc.(Computer Science) - Semester II								
WINDOWS PROGRAMMING USING VC++								
CO1	Provides many tools for coding and debugging visual codes	M	H	H	M	M	M	H
CO2	Facilitates as a lightweight tool to edit your C++ files	H	M	H	M	M	M	H
CO3	Provides add-on features such as smart pointers, New Container, Polymorphism, Exception Handling etc	H	H	M	M	M	M	H
CO4	Encapsulates multiple applications and hence can make use of the package with installing it once	H	H	H	M	M	M	H
THEORY OF COMPUTATION AND COMPILER CONSTRUCTION								

CO1	Analyze the behaviour of machines and how they solve a problem	M	H	H	H	M	H	H
CO2	Problems solving in many fields beside computer science such as physics, economy, biology etc	M	H	H	H	M	H	H
CO3	Would know program execution using lexical and syntactical analysis	M	H	H	H	H	H	H
CO4	Can correlate the working of compiler in program execution	M	H	H	H	H	H	H
COMPUTER ARCHITECTURE AND ORGANIZATION								
CO1	To explore the fundamentals of Computer Architecture and Organization	H	H	M	H	H	H	H
CO2	To understand the design of control unit	M	H	M	H	H	M	H
CO3	To study the concepts of memory organization and to understand various memory technologies	H	M	M	H	H	M	H
CO4	To understand the concepts of input output processing to interface various I/O devices	H	M	M	H	H	H	H
COMPUTER GRAPHICS								
CO1	Provides user interfaces, data visualization, television commercials, motion pictures	H	M	H	H	H	H	H
CO2	Hardware devices and algorithms which are necessary for improving the effectiveness, realism, and speed of picture generation	H	M	H	H	H	H	H
CO3	Three dimensional graphic algorithm are incorporated in various streams to better simulate complex interactions	H	H	H	H	M	H	H
CO4	3-d transformations, b-spline surfaces, curves, and hidden surfaces can be explored	H	H	H	H	H	M	H
Practical I								
CO1	Helps to understand the nature of efficient computation	H	H	H	H	M	H	H
CO2	Facilitates in efficient problem solving	H	H	H	H	M	H	H
CO3	To understand the nature of efficient computation	H	M	M	H	H	M	H
CO4	Apply and redistribute runtime packages mostly installed for standard libraries that many applications use	M	M	M	H	H	H	M
Practical II								
CO1	Would gain the knowledge about inside of computer	H	M	M	M	M	H	H
CO2	Develop the design concepts of latest processors	M	M	M	M	M	M	M

CO3	Study the common elements in user interfaces, data visualization, television commercials, motion pictures, and many other applications	H	H	H	H	H	H	H
CO4	Explore the algorithms necessary for basic transformation with respect to computer graphics	H	M	M	M	M	H	H

COURSE NAME: M.SC.(COMPUTER SCIENCE) - SEMESTER III

DATA COMMUNICATION AND NETWORK

CO1	To understand and master the fundamentals of data communications through the knowledge of data transmission concepts, media used for data communication	H	M	M	M	H	H	H
CO2	To compress the data, different compression algorithms used to optimize data transfer even if the network is congested	H	M	M	H	H	H	H
CO3	Various network routing algorithms, data link layer protocols are necessary to be understood while working on networking concepts	H	H	H	H	H	H	H
CO4	Exploring frequency and time division multiplexing techniques to share network bandwidth among multiple users are very necessary to be learnt	M	M	H	H	H	H	H

SOFTWARE ENGINEERING

CO1	To Get detailed knowledge of role of software in daily basis	H	H	H	H	H	H	H
CO2	Student will be identifying different models and find out the best	H	H	H	H	H	H	H
CO3	Test the developed software for high performance and maintainability	M	H	H	H	H	H	H
CO4	Study the software measure parameters for software quality	M	H	H	H	H	H	H

CE1-1(ELECTIVE 1) NEURAL NETWORK

CO1	Provides an understanding of underlying geometry of foundation Neural Network models	H	H	H	H	H	H	H
CO2	Helps in Neural Network algorithm along with an approach to neuro-science findings	H	H	H	H	H	H	H
CO3	Necessary for the research community around the world to realize the biological fidelity	H	H	H	H	H	H	H
CO4	Develop powerful computational models that has applications to vast number of disciplines	H	M	L	H	H	H	H

CE1-2(ELECTIVE -2)MOBILE COMPUTING

CO1	Helps to understand the fundamental requirements for initiating an online business	M	M	M	M	M	H	H
CO2	Helps in process of initiating and funding a start-up, e-Business or large e-projects	H	H	H	M	H	H	H
CO3	Necessary to describe the issue and methods of transforming an organization into an e-business	H	H	H	H	H	H	H
CO4	Provides deeper knowledge of mobile handheld devices, wireless mediums, palm OS, MANNET	H	M	M	H	H	H	H

CE1-3 MULTIMEDIA TECHNOLOGIES

CO1	Define multimedia to potential clients	M	M	M	M	M	H	H
CO2	Identify the basic components of a multimedia project	M	H	H	H	H	H	H
CO3	Identify the basic hardware and software requirements for multimedia development and playback	H	H	M	H	H	H	H
CO4	Identify and describe the function of the general skill sets in the multimedia industry	M	M	M	M	M	M	H

CE1-4 ASP.NET

CO1	Helps to create web form with server control	H	M	M	M	M	M	H
CO2	Separate page code from content by using code-behind pages, page controls, and Components	M	H	H	H	H	H	H
CO3	Display dynamic data from a data source by using Microsoft ADO.NET	M	M	M	M	M	H	H
CO4	Debug ASP.NET Pages by using trace	M	M	H	H	H	H	H

CE1-5 DIGITAL AND CYBER FORENSICS

CO1	Cite and adhere to the highest professional and ethical standards of conduct, including impartiality and the protection of personal privacy	M	M	H	M	H	H	H
CO2	Identify and document potential security breaches of computer data that suggest violations of legal, ethical, moral, policy	M	M	H	M	H	H	H
CO3	Work collaboratively with law enforcement to advance digital investigations or protect the security of digital resources	M	M	H	M	H	H	H
CO4	Access and critically evaluate relevant technical and legal information and emerging industry trends	H	M	H	M	H	H	H

PRACTICAL V

CO1	Analyse And Setup Protocol Designing Issues For Communication Networks	H	M	M	H	H	H	H

CO2	Estimate The congestion Control Mechanism to improve Quality Of Service of Networks	M	M	H	H	H	H	H
CO3	To implement Software prototyping for better software development	H	M	M	H	H	H	H
CO4	To acquire skills to think about problems and solution using appropriate method	H	H	H	H	H	H	H
Practical VI								
CO1	To design neuro-biologically oriented models	H	M	M	H	H	H	H
CO2	To implement deep learning for solving real world problems	M	M	H	H	H	H	H
CO3	To train through hands-on on m-computing for ease of use	H	M	M	H	H	H	H
CO4	To secure digital documents through data hiding, water marks etc	H	H	H	H	H	H	H
Course Name: M.Sc.(Computer Science) - Semester IV								
DATA MINING								
CO1	Necessary to deal with explosive growth of the stored and transient data	H	M	H	M	H	H	H
CO2	Introduces new techniques and automated tools useful in transforming data into knowledge	H	M	H	H	H	H	H
CO3	Provides basic Techniques for OLAP & Data generalization	H	M	H	H	H	H	H
CO4	Helps to identify different cluster analysis techniques and advanced data mining techniques	H	M	H	H	H	H	H
ARTIFICIAL INTELLIGENCE & EXPERT SYSTEM								
CO1	Explore AI problem solving techniques	H	M	H	M	H	H	H
CO2	Explore techniques knowledge representation in Machine	H	M	H	H	H	H	H
CO3	Helps in a deeper knowledge towards natural language processing, robotics	H	M	H	H	H	H	H
CO4	Necessary in decision making, problem solving, perception and understanding human communication	H	M	H	H	H	H	H
CE2-1 DESIGN & ANALYSIS OF ALGORITHM								
CO1	Ability to analyze performance of algorithms	M	H	H	M	H	H	H
CO2	Choose appropriate algorithm for problem solving	M	H	H	M	H	H	H
CO3	Analyze worst-case running times of algorithms using asymptotic analysis	M	H	H	M	H	H	H
CO4	Analyze greedy algorithm and its applications, divide and conquer strategy	M	H	H	M	H	H	H
CE2-2 EMBEDDED SYSTEM								
CO1	Helps to addresses the issue of the response time constrain of various tasks	M	H	H	H	H	H	H

CO2	Necessary for designing high performance response time constrained sophisticated systems	H	H	H	H	H	H	H
CO3	Helps to develop the systems that make optimum use of the available system resources: processor, memory	H	H	H	H	H	H	H
CO4	Employ the key concepts of embedded systems like sensors and actuators	M	H	H	H	H	H	H
CE2-3 PATTERN RECOGNITION								
CO1	Apply performance evaluation methods for pattern recognition, and critique comparisons of techniques made in the research literature	H	M	H	M	H	H	H
CO2	Apply pattern recognition techniques to real-world problems such as document analysis and recognition	H	M	H	H	H	H	H
CO3	Implement simple pattern classifiers, classifier combinations, and structural pattern recognizers	H	M	M	M	H	H	H
CO4	Summarize, analyze, and relate research in the pattern recognition area verbally and in writing	M	L	M	M	M	M	H
CE2-4 PARALLEL COMPUTING								
CO1	Introduces to various models of parallelism such as shared and distributed memory	H	H	H	M	M	H	H
CO2	Develop parallel computing solutions with respect to different mapping techniques	M	M	H	M	H	H	H
CO3	Helps in developing and implementing various routing mechanism necessary for parallel computing	M	M	H	M	H	H	H
CO4	Contribute as driving force in development of faster computers	H	M	H	M	H	H	H
CE2-5 MOBILE & CYBER FORENSICS								
CO1	Introduces to Computer Forensics Fundamentals	H	H	H	H	H	H	H
CO2	Helps to analyze and explore different forensic technologies	H	M	H	H	M	H	H
CO3	Helps to identify methods of digital evidence preservation	H	M	H	H	M	H	H
CO4	Helps in exploring data recovery in mobile forensics	H	M	H	H	M	H	H
PRACTICAL VII								
CO1	To implement standard data mining techniques and methods such as association rules, clustering techniques	H	H	H	H	H	H	H
CO2	To apply data mining techniques on datasets for realistic sizes using	H	H	H	H	H	M	h

	modern data analysis frameworks							
CO3	Implement microcontroller interfacing	H	H	M	M	M	H	H
CO4	To implement real time operating system using embedded	H	M	M	M	M	H	H
PROJECT								
CO1	To display the working knowledge and skills to the industry	H	H	H	H	H	H	H
CO2	Deeper knowledge of methods in major field of study	H	H	H	H	H	H	H
CO3	To gain a consciousness of ethical aspects of research and development work	H	H	H	H	H	H	H
CO4	Capability to plan and use adequate methods to conduct qualified tasks in given frameworks and evaluate the work	H	H	H	H	H	H	H

Program Outcomes, Program Specific Outcomes & Course Outcomes: M.Sc. Zoology

Program Outcomes (POs)

PO 1- M.Sc. program produces post-graduates who have great readiness in playing active role either in government or non-government organization by designing processes/strategies that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO 2- Students developed analytical and creative thinking from the conducive research environments and interacting with scholars/ faculties that will help in identifying the assumptions that frame our thinking and actions, checking out the degree to which these assumptions are accurate and valid, and looking at our ideas and decisions (intellectual, organizational, and personal) from different perspectives.

PO 3- To use research-based knowledge and research methods including review research literature, accession of primary literature, identify relevant works for a particular topic, design of experiments, analysis, evaluation and interpretation of scientific data, and synthesis of the information to provide valid conclusions in real situations.

PO 4- To empower students to create, select, and apply appropriate techniques, resources, and ICT tools for understanding of the science.

PO 5- Apply ethical principles and commit to professional ethics and responsibilities and norms of the work/research practice. Also, to promote learning and research aptitude and attitude to serve the society.

PO 6- Students are encouraged to develop an analytical mind as they ask questions, take part in topic-based quiz and debates, and are made aware of recent study and research on relevant topics.

PO 7- To enhance the ability of writing research project activities, problem-solving, to design and carry research project.

PO 8- M.Sc. program produces post-graduates who have great confidence which allows them to have a positive and realistic perception of themselves and their abilities in the scientific and social environment.

PO 9- Students acquiring skill-based education will make them self-employable and can generate employment.

PO 10- Students are encouraged to develop analytical and critical thinking minds which will help to develop scientific temperament in the community.

Program Specific Outcomes (PSOs)

PSO 1- Students will acquire techniques and skills to implement the knowledge in the design and execution of research in different branches of Zoology. This will help in careers related to teaching, research in Zoology; as well as in having innovative ideas and necessary training to initiate unique start-ups and entrepreneurship in the realm of life sciences.

PSO 2- To learn and apply the ethics in animal handling, during laboratory practices and experimentation.

PSO 3- In addition to the curriculum, the students will also gain skill-based learning, practical knowledge to facilitate experiments in the subject Zoology.

PSO 4- Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings. Demonstrate knowledge and understanding of Zoology and management principles and apply these to one's own work, as a member and leader in a team.

PSO 5- To acquired knowledge across a broad range of Zoology including recent trends which will help to solve the scientific problem logically in the context of biological process. Thus, leading to self-directed learning and evaluation.

PSO 6- Perform laboratory procedures as per standard protocols in various areas of Zoology including Animal Diversity, Cell Biology, Genetics, Molecular Biology, Physiology, Developmental Biology, Comparative Endocrinology, Immunology, Mammalian Reproductive Physiology, Fish and Fisheries and Entomology.

PSO 7- Understand the applications of zoological science in Apiculture, Sericulture, Lac culture, Fish and Fisheries, Mammalian Reproductive Physiology and Animal Physiology.

PSO 8- Develop knowledge and understanding of living organisms at several levels of Zoological and Biological organization from molecular level, through cells and ultimately the whole organisms and its impact on ecosystems.

PSO 9- To develop interest and elective modules by selecting specialization in various aspects and understanding the methods of zoological research.

PSO 10- The M. Sc. Program will lead the students to impart a scientific temperament which will help them to add new scientific knowledge/information in the field of Zoology

M.Sc. Zoology Semester-I

MZO1T01 Paper- Biology of Non- Chordata
Course Outcomes (COs)

Students will be able to identify, classify, describe, discuss and explain invertebrate specimen in the field as well as maintain and organize museum specimen. Develop a skill to demonstrate and explain different anatomical systems, physiological body processes and diversity of invertebrates, animal architecture and functions. Create the awareness of the economic importance, significance and explain structural and functional relationship between invertebrate phyla. Assess and evaluate a taxonomic status of primitive members of arthropods and molluscs. Describe and analyze the sea star's body plan, elucidate the origins and evolutionary significance of echinoderm larval forms, comprehend the mechanism of movements based on fluid filled cavities in invertebrates and identify and classify minor invertebrate specimen. Perform the whole mount preparations of given invertebrate material.

MZO1T02- Cell Biology and Genetics

Course Outcomes (COs)

Students will be able to describe and explain the structure and function of plasma membrane through fluid mosaic model, types of membrane proteins, transport and organization of cytoskeleton, cell organelles and endomembrane system. Differentiate and illustrate the mechanism of Cell division, cell cycle regulation, types of cell signalling, signal transduction pathways and various receptors involved in cell signalling. Describe and differentiate the types and functions of cellular communication, cell adherence molecule and extracellular matrix interaction. Differentiate Mendelian, non-Mendelian inheritance and solve the problems of inheritance based on probability. Explain, differentiate and compare codominance, incomplete dominance, gene interactions, linkage, crossing over, sex limited and sex influenced characters. Illustrate and differentiate the mode of inheritance of polygenic and monogenic traits, role of genetic and environmental factors of inheritance, inbreeding and its consequences and deduce coefficient of inbreeding and consanguinity. Explain, distinguish and describe the mutation and its types, structural and numerical alterations of chromosomes as well as the extra chromosomal inheritance, maternal inheritance, microbial genetics, genetic mapping and human genetics by

Semester I

MZO1T03- Electives

1. Mammalian Reproductive Physiology - Male

Course Outcomes (COs)

Students will be able to describe and demonstrate the development processes and functions of different units of testis. Deduce the structure, functions, regulation, anomalies and disease of male reproductive and accessory reproductive organs and understand the mechanism of sperm capacitation. Explain and discuss the role of hormones in the regulation of reproductive behaviour and types of breeding systems. Recognize and identify structural and functional aspect of different types of pheromones. Illustrate and counsel about the factors responsible for infertility. Assess and describe reproductive health dysfunction affected by aging in males. They could able to demonstrate fructose, acid and alkaline phosphatase, sialic acid and sperm count analysis.

MZO1T03

2. Digestive and Excretory Physiology

Course Outcomes (COs)

The students will be able to differentiate and compare the types, anatomical structures, secretory and endocrine cells present in the histological structure, mechanism of secretion along with the neural and chemical control secretion of different digestive glands such as the salivary gland, stomach, pancreas, liver and intestine etc. along with movement of GIT. Demonstrate the effects of various factors on the activity of digestive enzymes. Describe, explain and compare gut brain axis, mechanism of digestion of various biomolecules such as carbohydrates, proteins and lipids and disorders associated with the GIT. Describe, explain and compare the anatomy of kidney, types and ultrastructure of nephron, mechanism of urine formation, concentration and dilution of urine and normal and abnormal constituents of urine along with micturition. Determine the regulation of urine and body fluid concentration and volume along with water, electrolyte and acid base balance. Describe, explain and compare mechanism of ADH, RAAS system, renal clearance, physiology of nitrogen excretion and causes, symptoms and treatments of renal failure. They will be able to qualitatively demonstrate the presence of various normal and abnormal constituents of urine. Further, they will demonstrate the presence of normal and abnormal urine crystals.

MZO1T03

3. General Fish Biology

Course Outcomes (COs)

Students will be able to explain and describe the evolutionary significance of fishes through the concepts of origin, classification and general characters of Ostracoderms, Placoderms and Chondrichthyes. Explain, describe and compare general characters and classify different ranks of Superorder Pisces. Identify different marine and freshwater fishes. Explain and describe peculiarities and affinities of Dipnoi, comparative account of accessory respiratory

organs and different systems in fishes. They could estimate CO_2, dissolved O_2 and chloride of water and protein, sodium and potassium content of blood sample in fish.

MZO1T03

4. General Entomology

Course Outcomes (COs)

Students will able to identify, classify and differentiate the various insects belonging to different ranks. Describe, explain, and analyse insect social organization and its peculiarities. They could describe and explain structure of reproductive system, specialized reproductive mechanism, embryogenesis and metamorphosis in insects.

MZO1T04 - Research Methodology

Course Outcomes (COs)

Students will be able to learn, describe and imbibe animal ethics in research, as well as various guidelines provided by IAEC and CCSEA. Students will be able to compare the model organisms used in biological science. They will able to discuss and determine the animal facilities to laboratories, transportation, hygiene, environment, maintenance, ethical, legal and policy issues. Encourage students to pursue their interests in research and to investigate selecting appropriate methodology of scientific research. Students could design the experiments properly. They will be able to write scientific reports, research proposals, patents, review articles, and will be aware of major funding agencies. Improve the knowledge of computer skills. They will be able to use basic computer programmes such as MS-Office, Coral Draw, and Photoshop. Students will analyse and use statistics to analyse data in biological research. They will able acquainted with AI and its use in Life Science as well as to apply various statistical tools like central tendency, dispersion, skewness, and kurtosis measures to analyze results in the research work. They also learn measures of relationship tests of hypothesis testing of significance and know about statistical software. Students will also able to learn and acquainted with IPR and Patent registration.

M.Sc. Zoology Semester II

MZO2T05 - Biology of Chordata

Course Outcomes (COs)

Students will be able to describe and recognize unique characters, life functions, connecting link between non-chordates and chordates and the diversity of urochordates, cephalochordates, cyclostomes and fish. Describe the structural, physiological and evolutionary correlation of different vertebrates; elaborate how kidneys represented successful evolutionary responses to the surrounding environmental pressures. List some migratory bird species, conduct bird tracking and watching activity. Facilitate students to explore the world of cetaceans and the marine environment. Gain a better understanding of the forces that drive evolution, speciation and the diversity of life on our planet. Identify, describe and differentiate the basic structure and functions of the central and peripheral nervous systems and define learning and memory. Compare and contrast the organization and evolution of the vertebrate circulatory system and heart. Describe specialized sensory organs of vertebrates and relate their role to their habitat. Comprehend the gradual development and evolutionary history of man. Identify, classify, describe and explain vertebrate specimen in the field as well as maintain and organize museum specimen. Develop a skill to demonstrate and explain different anatomical systems of vertebrate, and perform whole mount preparations of given vertebrate materials, different steps of microtomy and staining procedure. They could use, handle and maintain the instruments like microtome and oven. Students will able to identify, demonstrate, explain and compare the histological structure and functions of internal organs of vertebrates.

MZO2T06 - Advanced Developmental Biology

Course Outcomes (COs)

Students will be able to differentiate and explain the basic developmental concept of insects, cast differentiation in insects, amphibian metamorphosis and aves with its hormonal control and regeneration process in vertebrates. Illustrate and classify the type, structure, function and hormones of the placenta, analyse the cell differentiation, organ formation, cell death, and multiple physiological levels of aging. They will be able to analyse the process of advanced cattle breeding with the help of MOET, cloning techniques, acquire knowledge about embryonic sexing to diagnose the genetic disorder, the economic and clinical significance of embryonic stem cells. Comprehend birth control method that uses the body's immune response and classical contraceptive techniques to prevent pregnancy. Explain different anti-androgen and anti-spermiogenic compounds and also discuss transgenic animals that elevated the potential of biological research for human welfare. They will able to demonstrate the development of *Lymnea* and mounting of Chick embryo.

MZO2T07 -Electives

1. Mammalian Reproductive Endocrinology
Course Outcomes (COs)

Students will be able to comprehend the structural and functional aspect of hypothalamus. Illustrate regulations and feedback mechanism of various neurohormones, neurotransmitters and neural signals, structural and physiological role of pituitary. Elucidate the histological organization of endocrine glands, gonads and correlate it with the health issues. Describe and explain the non-steroidal regulators of reproduction, the hypothalamic-pituitary axis with the help of gonads, adrenal and thyroid gland, the mechanism of biosynthesis, mode of action and function of reproductive hormones such as estrogen, progesterone, androgen and inhibin that are involved in sexuality and fertility. Prepare, identify, differentiate and explain the histological slides of endocrine gland.

Course Outcomes (COs)

Students will be able to differentiate and classify the various morphological differentiation and analysis of the mammalian brain, brain stem and cerebellum. Elaborate on the physiology and mechanism of learning, memory and sleep. Classify and illustrate the ultrastructure of neurons and synapses, functional and bioelectrical properties of the neurons, molecular mechanism of synaptic transmission and mechanism of neurotropins and growth factors affecting the neuronal growth. Classify and analyse the biosynthesis, storage, release and mechanism of the action of various neurotransmitters and neuropeptides. Differentiate between the structure and physiology of various organs involved in photoreception and phonoreception. Analyse the various causes, symptoms, mechanism of pathogenesis, diagnosis and treatment of neurodegenerative disorders. Explain and describe the classification, ultrastructure, properties and structural proteins of muscle. Illustrate the molecular mechanism of muscular contraction, ultrastructure of the neuromuscular junction and types, causes, symptoms and treatment of various neuromuscular disorders. They could able to demonstrate and estimate liver and muscle glycogen, protein and lipid.

3. Economic Aquaculture

Course Outcomes (COs)

Students will be able to describe, explain and compare different water bodies of India, basic techniques used for fish breeding, concepts of fish culture, culture of air breathing fishes,

trout fish culture, Ornamental fish culture, integrated fish farming, sewage fed fisheries and cultivation of Indian major carp's. Describe, explain and compare advanced techniques used in aquaculture-based organisms such as pearls, crab, prawn, and oyster.

4. Insect Morphology and Physiology

Course Outcomes (COs)

Students will able to explain, describe and compare morphology of integument, head, thorax, abdomen, appendages and wings. They could describe, explain and differentiate structure and physiology of systems like digestive, circulatory, respiratory, nervous and neuroendocrine system etc. Students will be able to describe, explain and compare the sensory organs like visual organs, sound and light producing organs, bioluminescence, different mechanoreceptors and chemoreceptors. Describe, explain and compare mechanism of communication, colour change, mimicry and camouflage.

M.Sc. Zoology Semester-III

MZO3T08 - Parasitology and Immunology

Course Outcomes (COs)

Students will be able to illustrate and differentiate life cycle, mode of transmission, infection and treatment of various bacterial infection and viral infections such as covid, dengue, hepatitis. Describe, explain, classify and differentiate organs of immune system, innate immunity, adaptive immunity, antigen, antibodies, toxin anti-toxin and their cellular target. Demonstrate antigen-antibody interaction with the help of ODD. Illustrate the maturation, activation, differentiation of T and B cell, inheritance of MHC molecules and various pathways of complement system. Classify, describe and differentiate various types of cytokines, hypersensitivity, autoimmunity and immunodeficiency diseases. Explain and describe activation and migration of leucocyte, mast cell, transplantation, tumor immunology, various infectious diseases and vaccines. Illustrate and differentiate working principle and significance of immunotechniques such as RIA and ELISA.

M.Sc. Zoology Semester-III

MZO3T08 - Parasitology and Immunology

Course Outcomes (COs)

Students will be able to illustrate and differentiate life cycle, mode of transmission, infection and treatment of various bacterial infection and viral infections such as covid, dengue, hepatitis. Describe, explain, classify and differentiate organs of immune system, innate immunity, adaptive immunity, antigen, antibodies, toxin anti-toxin and their cellular target. Demonstrate antigen-antibody interaction with the help of ODD. Illustrate the maturation, activation, differentiation of T and B cell, inheritance of MHC molecules and various pathways of complement system. Classify, describe and differentiate various types of cytokines, hypersensitivity, autoimmunity and immunodeficiency diseases. Explain and describe activation and migration of leucocyte, mast cell, transplantation, tumor immunology, various infectious diseases and vaccines. Illustrate and differentiate working principle and significance of immunotechniques such as RIA and ELISA.

MZO3T09 - Wild Life and Avian Biology

Course Outcomes (COs)

Students will explain, describe and analyze importance of wildlife and its conservation, international conservation bodies, predator-prey relationship, population dynamics of ungulates and carnivores. They could also explain, describe and analyze morphology, morphometry of birds, birds diversity, techniques of bird counting, bird breeding population and breeding group maps, bird hotspots, bird sanctuaries and role of birds in ecosystem.

MZO3T10- Comparative Endocrinology

Course Outcomes (COs)

Students will be able to identify, classify, differentiate, describe and explain different types of cells and organs of neuroendocrine system of invertebrates. Illustrate the role of hormones in the regulation of various physiological processes in invertebrates such as metamorphosis, reproduction and colour change mechanisms. Describe, explain, and differentiate the hypothalamo-hypophysial system, structure, hormones, functions and feedback mechanisms of pituitary, thyroid, parathyroid, pancreas, gastro-intestinal tract and adrenal gland. Comprehend the role of hormones in pharmaceuticals, including contraception, sex hormones, cancer, immune system and immune regulating hormones (IRH). Raise awareness about the significance of pharmaceutical applications. Students could demonstrate compare the preparation of histological slides of endocrine glands.

MZO3T11- Electives

1. Mammalian Reproductive Physiology –Female

Course Outcomes (COs)

Students will be able to understand and evaluate the different processes and hormonal control of ovarian cycle. Describe and specify the mechanism and hormonal control of uterine cycle in different mammalian species. Comprehend the structure, function, regulation, anomalies and disease of female reproductive tract. Discuss the physiological and hormonal reasons behind bodily changes at puberty, the importance of prostaglandins in reproduction. Recognize the anatomical structure and development of breasts, mechanism of synthesis, secretion and ejaculation of milk via hormonal influence. They could detect and confirm the pregnancy by using female urine sample.

2. Blood and Cardiac Physiology

Course Outcomes (COs)

The students will be able to illustrate the structure, properties and function of cardiac muscle along with the anatomy, histology, nerve innervation and valves of the heart. They will further be able to classify and compare the pacemakers and conducting fibers present in the heart, and illustrate various types, causes, symptoms, diagnosis, and factors affecting blood pressure and treatment. Illustrate and compare the mechanism of the cardiac cycle, heart sound, working principle of ECG, cardiac output, haemodynamic, haemorrhage, cardiac murmur, circulatory shock and cardiac failure. Describe, explain and compare the cellular composition and functions of blood, blood groups, blood transfusion, bone marrow aspiration and pathological conditions of blood glucose and lipids along with blood coagulation. Compare and illustrate the transport of gases by blood, diagnosis, symptoms and treatment of bleeding disorders and blood cancer. Illustrate the mechanism of formation, composition, transport and functions of lymph. Differentiate, describe and explain anaemia and polycythemia, platelets and Blood substitute. Students will be able to demonstrate the components of the blood such as RBCs, WBCs, DLCs, Hb etc. along with the blood group.

3. Fish Physiology

Course Outcomes (COs)

Students will be able to describe, explain and compare structure and physiology of associated system like digestive, sensory organs, osmoregulation, nervous system and reproductive system of teleost. They could explain and describe different mode of migration in fishes with respect to periodicity and role of hormones. They could also explain, describe and analyse hormonal control via hypothalamo-hypophysial system and neuroendocrine system of gametogenesis and reproductive behavior in fishes. Students could also able to demonstrate and explain ablation of gonad in fishes.

4. Insect Pest Management
Course Outcomes (COs)

Students will study about life cycle, host plants, damage and control measures of various insect-pests of field crops. Identify common insects and insect pest of different orders available in local area and could form local or regional insect diversity register as well as demonstrate different pathogen in insect tissues. Students will be able to illustrate and compare the properties, mode of action and uses of inorganic insecticide, chlorinated hydrocarbons, organophosphates and botanical insecticides. Explain and describe biological control measure, nano-biopesticide, pathogenic viruses, bacteria, parasitoids and predators of insect pests. Describe various

M.Sc. Zoology Semester-IV
MZO4T12 - Biotechniques, Biostatistics, Toxicology and Bioinformatics

Course Outcomes (COs)

Students will be able to elaborate, discuss and describe sterilization, animal cells, tissue culture, primary culture, cell lines, cell quantification, and growth kinetics and cryopreservation technique. Describe, demonstrate and explain the principle and working mechanism of sedimentation, centrifugation, TLC, gas chromatography and electrophoretic technique. Illustrate and explain the biostatistical measures such as central tendency, dispersion, probability, sampling types, methods and significance test. Describe and explain neuronal genetics, environmental components in the development of animal behaviour, organization and functions of animal ethics. Illustrate and explain about the significance of toxicity test in the projects and research. Describe and explain the importance and scope of bioinformatics, various biological databases such as BLAST and FASTA, PSI- BLAST etc. and various program runs for the construction of phylogenetic tree like MEGA. Students could construct, analyze and interpret phylogenetic tree.

MZO4T13- Radiation and Chronobiology
Course Outcomes (COs)

The students will be able to define and explain the scope and significance of radiobiological scope in human welfare. Identify ionizing radiation, linear energy transfer, radiation dose and units and conceptualize the radiation types. Describe, explain and analyze application of radiology and gainful and harmful effects of radiation. Comprehend the concept of circadian rhythm, central clock system and peripheral clock system. Students will describe, explain and analyze centers of biological clock, relevance of biological clock in human welfare, mechanism of regulation of biological clock and effects of irregularity of biological clock and its remedies.

MZO4T14 -Molecular Biology and Biotechnology

Course Outcomes (COs)

Students will be able to analyse the basics of cellular genome, organization of genetic material, fundamental process of duplication of genetic material in prokaryotes and eukaryotes important for cell division. Evaluate the different types of DNA damage and repair mechanism. Illustrate the fundamentals of various mobile DNA elements useful in horizontal gene transfer, evolutionary process and gene expression in prokaryotes and eukaryotes. Explain the mechanisms and regulation of operon models significant in regulation of gene expression in prokaryotes. Illustrate the fundamental process of protein synthesis with explanation of antisense and ribozyme technology. They could differentiate and distinguish DNA sequencing and gene amplification methods, cloning by different cloning vectors for recombinant DNA technology. Explain and describe the applications of

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B.COM. PROGRAM OUTCOME & COURSE OUTCOME

Program Outcomes, Program Specific Outcomes & Course Outcomes: B.Com.

Program Outcomes of Bachelor of Commerce

PO1 - To equip the student to face the modern-day challenges in commerce and business.

PO2 - To enable the students to acquaint with the dynamics of business scenario in India.

PO3 - To make aware the students with basic concept of Financial Accounting and create awareness Among students regarding concepts and convention of accounting.

PO4 - To make students familiar with the modern management practices being used by the corporate World.

PO5 - To co-relate international contexts and issues through the lens of the commerce disciplines.

PO6 - To help young students for understanding the subject in a systematic manner with lucid exposition of its different facts.

PO7- Understand Social Responsibility of business towards various stakeholder of business.

PO8 -To acquire knowledge of micro- & macroeconomic theory as it relates to recent policies and issues

PO9 - To equip students to face challenges as entrepreneurs.

PO10 - To enable the students to understand and apply mathematical and statistical techniques to Practical business problems

PO11 - To understand the importance of being an effective business communicator in today's changing Workplace.

Following subjects run under this program

Major Subject: Accounting & Taxation

Program Specific Outcomes

PSO 1 - Develop necessary professional knowledge and skills in accountancy and taxation.

PSO 2 - Demonstrate the ability to interpret and analyse financial statements.

PSO 3 - Demonstrate effective oral and written business communication.

PSO 4 - Implement traditional and modern strategies and practices of costing, management, auditing and Taxation.

PSO5 - Develop competency in students to make them employable in the accounting and taxation Industry.

Major Subject: Business Administration

Program Specific Outcomes

PSO1 - Implement traditional and modern strategies and practices of business management and administration.

PSO2 - Demonstrate effective oral and written business communication.

PSO3 - Develop competency in students to make them employable in the corporate world.

PSO4 - Develop ethical practices and imbibe values for better corporate governance.

PSO5 - Demonstrate the ability to analyse in detail the company's act 2013 and other business regulations.

Major Subject: Finance and Banking

Program Specific Outcomes

PSO1 - Develop necessary professional knowledge and skills in banking and finance.

PSO2 - Demonstrate the ability to analyse the financial markets.

PSO3 - Understanding the rules and regulations laid down by market regulators like RBI, SEBI, IRDA, etc.

PSO4 - Implement traditional and modern strategies and practices of banking, finance, and insurance.

PSO5 - Develop competency in students to make them employable in the banking, finance and Insurance industry.

Major Subject: Computer Application

Program Specific Outcomes

PSO1 - Problem analysis: Identify, formulate, review, research, and analyse complex organisational problems reaching substantiated conclusions using principles of information technology and ethics of management.

PSO2 - Design/development ofsustainable solutions: Design solutions for problems that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, legal, ethical and environmental considerations using different computer application tools.

PSO3 - Skillsin Programming: Possess practical and theoretical knowledge of programming skills, database and web development tools sufficient to earn a living and contribute to the economic development of the region, state and nation.

PSO4 - Communication: Communicate effectively on complex technical activities with the community and society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PSO5 - Life-long learning: Recognize the need and ability to engage in independent and lifelong learning in the broadest context of emerging markets and technological change.

<p style="text-align:center">Subject Wise Course outcomes</p>

Subjects: - Principle of Business Management

Course Outcome

CO1 - The student will be able to identify different functions of management and management thoughts.

CO2 - The student will be able to differentiate between Management and Administration as well as identify the skills required for a manager.

CO3 - The student will be able to Outline and illustrate plans for various activities.

CO4 - The Student will be able to develop competency of decision making while working in a group.

CO5 - The student will be able to apply various management principles in his/ her day-to day life.

Subjects: - Commercial Laws

Course Outcome

CO1 - The Student will be able to understand various legal provisions related to Contract Act.

CO2 - The students will be able to understand the provision for special contracts.

CO3 - The students will be able to identify the legal provision of formations and management of the company.

CO4 - The students will be able to understand and identify the rights of consumers and the redressal mechanism.

CO5 - The students will be able to outline the scope of IT Act in business

Subjects: - Introduction to Commerce

Course Outcome

CO1 - The students will be able to understand various verticals in commerce education.

CO2 - The students will be able to compare various career opportunities in Commerce.

CO3 - The students will be able to map various profiles to his/her individual interests.

CO4 - The students will be able to choose suitable major, minor and other courses of study.

Subjects: - Economic System

Course Outcome

CO1 - The students will be able to understand various types of economic systems.

CO2 - The students will be able to understand socialist economic system.

CO3 - The students will be able to understand the working mechanism of Capitalist Economy.

CO4 - The students will be able to understand the structure of a mixed economy.

Subjects: - Professional Ethics

Course Outcome

CO1 - The student will be able to understand various human values needed in social and professional world and should be able to implement those.

CO2 - The students will be able to comprehend human values imbibed in ancient Indian education system.

CO3 - The students will be able to examine principles of ethics and their practice in a rational organization.

CO4 - The students will be able to examine and analyse ethical dilemma and ways to resolve the ethical issues in an effective way.

Subjects: - Elements of Statistics

Course Outcome

CO1 - The students will be able to create different types of tables for data presentation and will also be identify different types of data series.

CO2 - The students will be able to compute measure of central tendency.

CO3 - The students will be able to compute various measures of dispersion using quartiles, standard deviation, coefficient of variation etc.

CO4 - The students will be able to determine the skewness and tailedness of a data series.

Subjects: - Business Cycle Theory

Course Outcome

CO1 - The students will be able to differentiate between various phases of business cycle

CO2 - The students will be able to summarise the causes and impact of Inflation and deflation

CO3 - The students will be able to relate government policies with business cycle

CO4 - The students will be able to compare various business cycle theories.

Subjects: - Start – up Support Executive

Course Outcome

CO1 - Describe ideas and the legality of Start-up solutions.

CO2 - Discuss registrations and statutory compliances of Partnership. Identify Ideas and analyses the applicability of statutory filings

CO3 - Describe procedural codes of Registrar of Company

CO4 - Elaborate Preparation of documents.

Subjects: - Environmental Studies

Course Outcome

CO1 - Explain the basics of Environmental Science and Atmospheric Science along-with the components of Environment

CO2 - Explicate the importance of Environmental Education.

CO3 - Elucidate the fundamentals of atmospheric science including formation, depletion and effects of ozone layer and acid rain on environment.

CO4 - Describe the various physical and chemical characteristics and properties of Water and Soil understand the Ecology and its allied branches

CO5 - Comprehend about Population and Community Ecology.

CO6 - Study the changes in Population by understanding the concept of Population ecology.

Subjects: - Content Writing

Course Outcome

CO1 - The student will be able to understand basic concepts of content writing.

CO2 - The student will be able to gain knowledge regarding types of content writing and editing.

CO3 - The student will be able to acquire knowledge on various writing styles.

CO4 - The student will be able to create plagiarism-free content.

CO5 - The student will be able to understand and write effective content without plagiarism.

Subjects: - Indian Economics and Business Model

Course Outcome

CO1 - The students will be able to compare past and present Indian thoughts.

CO2 - The students will be able to understand Kautilya's Economic thoughts.

CO3 - The students will be able to understand agriculture and manufacturing framework in ancient India.

CO4 - The students will be able to compare various Indian Business Models.

B.C.C.A. PROGRAM OUTCOME &

COURSE OUTCOME

Program Outcomes, Program Specific Outcomes & Course Outcomes: B.C.C.A.

Program Specific Outcomes Bachelor of Commerce with Computer Application:

PSO1 - A student who has completed a B.Com. Computer Applications has career opportunities in both the Public and Private sectors where they can work as Business Consultants, Auditors, Business, Analysts, App Developers, Computer Programmers.

PSO2 - B.Com. Computer Application provides bright future in the IT fields, Software, Banks, MNC, BPOs and KPOs.

PSO3 - Develop critical thinking skills in students and seek variety of career options in accounting, management and business-related fields.

PSO4 - Analyse the scope of the business by adopting modern technology in the business practice.

PSO5 - On achievement of the course, successful graduates fascinated in pursuing higher studies in the discipline may go for pursuing MBA, MCA, and M.Com. M.Com (CA)., MCM., MSW., MA.

PSO6 - Students will prove themselves in different professional exams like C.A., C S, CMA, MPSC, UPSC.As well as other coerces.

PSO7 - After the successful completion of this course a student is familiar with the mechanism of conducting business dealings through electronic media.

Subject Wise Course outcomes

Subjects: - Fundamental of Computer

Course Outcome

CO1 - At the end student learn the use of Computer.

CO2 - Various practical will be taken through which students can operates MSOffice and operating System.

Subjects: - Programming in C

Course Outcome

CO1 - Students will able to write basic C Program.

CO2 - At the end of the topic students will able to use function and Array in the program.

CO3 - Students will able to write the C Program by using pointer and know how to use Structure, Union and File Concept in Program.

Subjects: - E - Commerce and Web Designing

Course Outcome

CO1 - Students will know the concept of Online Businessand Online Marketing.

CO2 - Student will learn to create web pages. • Students will learn to use various tags in HTML.

CO3 - Students will able to use scripting for web designing.

Subjects: - E – Visual Basic Programming

Course Outcome

CO1 - Student familiar with GUI (graphical user interface) environment.

CO2 - Creating project using user interface.

Subjects: - Core JAVA

Course Outcome

CO1 -   At the end of course students have the knowledge of the structure and model of the Java Programming Language.

CO2 - Use the Java programming language for various programming technologies.

Subjects: - Python

Course Outcome

CO1 - At the end student will learn how to design and program Python applications.

CO2 - They learn how to identify Python object types.

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M.COM. COURSE OUTCOME & PROGRAM OUTCOME

Program Outcomes, Program Specific Outcomes & Course Outcomes: M.Com.

Program Outcomes of Master of Commerce

PO1 - To impart the students with higher level knowledge and understanding of contemporary trends in Commerce business and finance.

PO2 - To get gainful employment in Banks, Insurance Company, Industries, Government departments etc.

PO3 - Equip the students to evaluate environmental factors that influence business operation with the conceptual requirements and skills on preparation and interpretation of financial statements.

PO4 - Facilitate the students to apply capital budgeting techniques for investment decisions prepare Students to appraise the structure and operations of banking system.

PO5 - Train the students on teamwork, lifelong learning and continuous professional development.

PO6 - Impart the students the concept of risk mitigation in financial sectors and theirrole in investment decisions of individuals and business enterprises

PO7 - It helps to grab research opportunities to pursue Ph.D.

PO8 - It helps to develop the ability to crack the target of UGC-NET examination.

Following subjects run under this program

Accounting & Taxation

Program Specific Outcomes

PSO1 - The student will be able to apply professional knowledge of accounting and taxation in real life business situation

PSO2 - The student will be able to interpret and analyse the financial statement

PSO3 - The student will be able to demonstrate effective oral and written business communication

PSO4 - The student will be able to implement traditional and modern strategies and practices of costing management auditing and taxation

PSO5 - Develop competency in students to make them employable in the accounting and taxation industry.

Program Specific Outcomes

PSO1 - Develop necessary professional knowledge and skills in various functional areas in business and commerce.

PSO2 - Demonstrate the ability to apply various theories of business management to solve business problems.

PSO3 - Demonstrate effective oral and written business communication.

PSO4 - Implement traditional and modern strategies and practices of business management, business economics and allied areas.

PSO5 - Develop competency in students to make them employable in the corporate world.

Subject Wise Course outcomes

Subjects: - Advanced Financial Accounting

Course Outcome

CO1 - Student will be able to gain knowledge about computer software accounting and will be able to amount of insurance claim.

CO2 - Student will be able to aware of Hire Purchase System and Instalment System.

CO3 - To develop competency of students to solve problem in accounting for service sector.

CO4 - To develop competency of students to solve problem in accounting for non-profit organization.

Subjects: - Advanced Cost Accounting

Course Outcome

CO1 - Student will be able to gain knowledge about classification of cost, methods and techniques and students will be able to calculate the cost of goods.

CO2 - To familiarize the student for process account.

CO3 - Student will be able to calculate the profit on contract.

CO4 - Student will be able to evaluate the reconciliation of cost and financial accounting.

Subjects: - Indian Financial System

Course Outcome

CO1 - Student will be able to understand various components of formal financial system.

CO2 - Students will be able to acknowledge the definition of banking and creation of money banking system.

CO3 - Student will be able to understand the basics of insurance and components related to it.

CO4 - Students will have the knowledge of process of creating funds in capital market.

Subjects: - Advanced Statistical Techniques

Course Outcome

CO1 - Students will develop an understanding of basics statistical decision making and analyse the significance.

CO2 - Students will be able to understand statistical quality control and will also be able to draw association of attributes and F test.

CO3 - Students will be able to understand analyse of time series and will also be able to calculate probability.

CO4 - Students will be able to perform regression analysis, interpolation and also know their usages.

Subjects: - Research Methodology

Course Outcome

CO1 - Formulate a research problem and identify appropriate research design for a specific research problem.

CO2 - Construct a data collection tool and identify appropriate tools for verification of hypothesis.

CO3 - Articulate research findings and be able to present the findings in research report.

CO4 - Understand various dimensions related to intellectual property rights.

Subjects: - Organization Behaviour

Course Outcome

CO1 - To learn and understand organization behaviour theories and be able to apply them in business organization.

CO2 - Compare and contrast job enlargement with job enrichment.

CO3 - Evaluate roles of conflicts, power and politics in determining group behaviour.

CO4 - Identify determinants of organization culture.

Subjects: - Business Laws

Course Outcome

CO1 - To learn and understand various provisions of business laws, and its application.

CO2 - Analyse the provisions of contract act in context of business organization.

CO3 - Analyse the provisions of Indian Negotiable Act.

CO4 - Evaluate the implications of provisions of cyber laws

Subjects: - Managerial Economics

Course Outcome

CO1 - Distinguish between the domains of micro and macroeconomics and their applications in business world.

CO2 - Determines factors affecting demand for a particular commodity and be able to ascertain demand in a given condition.

CO3 - Identify various elements of cost and relate the same with output and revenue under a given market condition.

CO4 - Determine the factors causing business cycles and be able to identify the business cycle stage with given economic indicators.

Subjects: - International Business

Course Outcome

CO1 - Determine factors international business environment.

CO2 - Critically evaluate International Trade Theories.

CO3 - Analyse impact of globalization on international business of a developing economy under a given foreign trade policy.

CO4 - Evaluate the role of developing countries in Regional Economic Integration.

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