AWADHESH PRATAP SINGH UNIVERSITY, REWA (M.P.)

Programme Outcomes, Programme Specific Outcomes & Course Outcomes

DEPARTMENT OF COMPUTER SCIENCE

Programme – M.Tech. (Computer Science)

Programme Outcomes

POs.1 An ability to independently carry out research/investigation and development work to solve practical problems.

POs.2 An ability to write and present a substantial technical report/document.

POs.3 Students should be able to demonstrate a degree of mastery over the area as per the specialization of the program.

POs.4 The mastery should be at a level higher than the requirements in the appropriate bachelor program.

POs.5 Conduct Investigations of Complex Problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

Programme Specific Outcomes

PSOs.1 The ability to understand, analyze, and develop computer programs in the areas related to algorithms, system software, web design and networking for efficient design of computer based systems.

PSOs.2 Students will be able to analyze system by sampling and investigating hard data. Also students will be able to identifying, forecasting/comparing cost and or benefits for system under study

Course Outcomes

MTECH-101- Advanced Computational Mathematics

COs.1 The idea of partial differentiation and types of partial differential equations and vector operations.

COs.2 The idea of classification of second partial differential equations, wave, heat equation and transmission lines.

COs.3 The basic ideas of statistics including measures of central tendency, correlation, regression and their properties.

COs.4 The ideas of probability and random variables and various discrete and continuous probability distributions and their properties.

COs.5 The statistical methods of studying data samples, hypothesis testing and statistical quality control, control charts and their properties.

MTECH-102-Advanced Data Structures and Algorithms

COs.1 Choose appropriate data structure as applied to specified problem definition.

COs.2 Handle operations like searching, insertion, deletion, traversing mechanism etc. on various data structures

COs.3 Handle operations on tree, graph and various running time complexity of algorithms

MTECH -103-Advanced Computer Architecture

COs.1 Study of the basic structure and operation of a digital computer system.

COs.2 Implementation of control unit techniques and the concept of Pipelining.

COs.3 Understanding the parallel algorithms, hierarchical memory system, cache memories and virtual memory.

COs.4 Understanding the different ways of communicating with I/O devices and standard I/O interfaces

MTECH-104-Advanced Computer Networking

COs.1 To apply the concepts of layered architecture in assessing the placement of network devices, protocols and services.

COs.2 To compare the services provided by the UDP/TCP transport layer protocols and explain the mechanisms used to provide a reliable data transport service on an unreliable IP network

MTECH-105-Object Oriented Technology

COs.1 Implementing Object Oriented programming concepts using basic syntax of control structures, strings and functions for developing skills of logic building activity.

COs.2 Identifying classes, objects, members of a class and the relationships among them needed for finding the solution to specific problems.

MTECH-201- Knowledge Representation

COs.1 Demonstrate fundamental understanding of the knowledge representation and its foundations.

COs.2 Apply basic principles of AI in solutions that require problem solving, inference, perception, knowledge representation, and learning.

MTECH-202-Advanced Operating Systems

COs.1 The structure of OS and basic architectural components involved in OS design.

COs.2 The various device and resource management techniques for timesharing and distributed systems.

COs.3 Ability to analyse various scheduling and synchronisation techniques.

MTECH-203-Data Mining and Warehousing

COs.1 Use of appropriate data mining tools like classification, clustering or Frequent Pattern mining on large data sets.

MTECH-204-(A) Software Testing & Quality Assurance

COs.1 Various software application domains and different process models.
COs.2 To handle various software testing tools with quality management.
COs.3 Converting requirements model into the design model and using software and interface design and engineering principles.

MTECH-204-(B) Enterprise Resource Planning

COs.1 Managing of ERP projects
COs.2 Demonstrate an understanding of the importance of data mining and the principles of business intelligence

MTECH-204-(C) Web Technology & Java Security

COs.1 To understand the security issues associated with various applications and associated data, various threats and be able to identify the key components of cyber security network architecture, apply cyber security architecture principles.
COs.2 Design and development of .Net and java applications using JSP.
COs.3 Students will be able to write a server side java application called JSP to catch form data sent from client and store it on database

MTECH-205-Advanced Database Management System

COs.1 Understand the database concepts, technology and practice ER diagrams for real time applications using DBMS

MTECH-301(A) Cloud Computing

COs.1 Enable students to appreciate the importance of Cloud Computing and assess the need of resources for a given scenario
COs.2 The program prepares the young professional for Understand how the different IT services can be provided with the help of Windows Azure, AWS, Google Cloud.
COs.3 To develop skills on Cloud Computing.

MTECH-301(B)-Legal Aspects of Information Security

COs.1 To have the awareness about information security standards, cyber crimes, Cyber Laws, Intellectual Property rights and various laws related to software's and semiconductors.

MTECH -302 (A) Network Security

COs.1 Understand the concepts of Network security and cryptography protocols.
COs.2 Slightly mapped as students will be able to understand the Network attacks and Cryptographic algorithms.
COs.3 Students will get to know about the maths behind the cryptographic algorithm which can contribute to the basic engineering knowledge

MTECH -302(B)- Mobile & Wireless Systems

- COs.1 Understand the concepts of mobile communication, signal propogation, modulation, medium access control.
- COs.2 Learn concepts of telecommunication systems, satellite systems, broadcast systems.
- COs.3 Understand wireless LAN, mobile network layer, adhoc networks, mobile transport layer.
- COs.4 Understand and analyse various supports for mobility such as file systems, www, WAP, i-mode, SyncML.

MTECH -302(C)- Software Reuse & Customization

- COs.1 Apply schedule and cost control techniques for project monitoring including contract management.
- COs.2 Apply quality models in software projects for maintaining software quality and reliability.
- COs.3 Use suitable project organization structure, leadership, decision and motivation styles, proper safety and ethical practices and be responsible to the society

MTECH-303- Dissertation Part-I

- COs.1 Students will be able to write synopsis, review literature and know about thesis and importance of research.

MTECH -304-Internet of Things (IoT)

- COs.1 To understand with the concepts of internet of things
- COs.2 To be familiar with the big data and cloud in the IoT basis
- COs.3 Students will know different IoT devices and working process

MTECH-401- Dissertation Part-II

- COs.1 Students will be able to write synopsis, review literature and know about thesis and importance of research.

MTECH-402- Data Science

- COs.1 To learn a powerful, flexible, and scalable general-purpose database to handle big data.
- COs.2 Deploy the Data Analytics Lifecycle to address big data analytics projects.
- COs.3 Apply appropriate analytic techniques and tools to analyze big data, create statistical models, and identify insights that can lead to actionable results.
- COs.4 To select appropriate data visualizations to communicate analytic insights to business sponsors and analytic audiences.

Mapping

M.Tech. (Computer Science)

Correlation Level

Level	Ranks
High (Substantially)	3
Medium(Moderately)	2
Low (Slightly)	1

Course Code	Course Outcomes	POs.1	POs.2	POs.3	POs.4	POs.5
MTECH-101	COs.1	3	3	3	3	3
	COs.2	3	2	2	2	1
	COs.3	2	3	3	3	3
	COs.4	3	2	2	2	2
	COs.5	2	1	1	3	3
MTECH-102	COs.1	3	3	3		
	COs.2	2	2	2		
	COs.3	3	1	1		
MTECH-103	COs.1	2	3	1	2	
	COs.2	2	2	1	2	
	COs.3	3	3	2	2	
	COs.4	3	2	2	2	
MTECH-103	COs.1	2	3			
	COs.2	2	2			
MTECH-104	COs.1	3	2			
	COs.2	3	3			
MTECH-105	COs.1	3	3			
	COs.2	2	3			
MTECH-201	COs.1	2	1			
	COs.2	3	2			
MTECH-202	COs.1	3	3			
	COs.2	3	3			
	COs.3	2	2			
MTECH-203	COs.1	3	3			
MTECH-204 (A)	COs.1	3	2	2		
	COs.2	2	2	1		
	COs.3	2	2	3		
MTECH-204-(B)	COs.1	2	2			
	COs.2	2	2			
MTECH-204-(C)	COs.1	3	2	3		
	COs.2	3	3	3		
	COs.3	2	3	3		
MTECH-205	COs.1	3				
MTECH-301(A)	COs.1	3	3	3		
	COs.2	3	3	3		
	COs.3	3	3	3		
MTECH-301(B)	COs.1	3				

MTECH -302(A)	**COs.1**	2	2	3		
	COs.2	2	2	3		
	COs.3	3	3	3		
MTECH -302(B)	**COs.1**	3	3	3	3	
	COs.2	3	2	2	3	
	COs.3	3	3	1	3	
	COs.4	3	3	3	3	
MTECH -302(C)	**COs.1**	2	2	2		
	COs.2	2	2	1		
	COs.3	3	3	1		
MTECH-303	**COs.1**	3				
MTECH -304	**COs.1**	3	3	3		
	COs.2	3	3	3		
	COs.3	3	3	3		
MTECH-401	**COs.1**	3				
MTECH-402	**COs.1**	3	3	3	3	
	COs.2	3	3	3	3	
	COs.3	3	3	3	3	
	COs.4	3	3	3	3	

AWADHESH PRATAP SINGH UNIVERSITY, REWA(M.P.)

DEPARTMENT OF COMPUTER SCIENCE

PROGRAMME: B.Sc. (HONS) COMPUTER SCIENCE

Programme outcomes (POs)

POs.1 The Learning Outcome-based Curriculum Framework in Computer Science is aimed at allowing flexibility and innovation in design and development of course content, in method of imparting training, in teaching learning process and in assessment procedures of the learning outcomes.

POs.2 The emphasis in computer science courses, in outcome-based curriculum framework, help students learn solving problems, accomplishing IT tasks, and expressing creativity, both individually and collaboratively.

POs.3 The proposed framework will help Students learn programming techniques and the syntax of one or more programming languages.

POs.4 Many of the learning outcomes of Computer Science can be achieved only by programming a computer for several different meaningful purposes.

POs.5 All students must, therefore, have access to a computer with a modern programming language installed. The computer science framework does not prescribe a specific language.

POs.6 The teacher and students will decide which modern programming languages students will learn. More importantly, students will learn to adapt to changes in programming languages and learn new languages as they are developed.

Programme Specific Outcomes (PSOs)

The present Learning Outcome-based Curriculum Framework for bachelor's degrees in Computer Science is intended to facilitate the students to achieve the following.

PSOs.1 To develop an understanding and knowledge of the basic theory of Computer Science and Information Technology with good foundation on theory, systems and applications such as algorithms, data structures, data handling, data communication and computation.

PSOs.2 To develop the ability to use this knowledge to analyse new situations

PSOs.3 To acquire necessary and state-of-the-art skills to take up industry challenges.

PSOs.4 The objectives and outcomes are carefully designed to suit to the above-mentioned purpose.

PSOs.5 The ability to synthesize the acquired knowledge, understanding and experience for a better and improved comprehension of the real-life problems

PSOs.6 To learn skills and tools like mathematics, statistics, physics and electronics to find the solution, interpret the results and make predictions for the future develop

Course Outcomes (COs)

101: Programming Methodology

COs.1 Learn to develop simple algorithms and flow charts to solve a problem.
COs.2 Develop problem solving skills coupled with top-down design principles.
COs.3 Learn about the strategies of writing efficient and well-structured computer algorithms/programs.
COs.4 Develop the skills for formulating iterative solutions to a problem.
COs.5 Learn array processing algorithms coupled with iterative methods.
COs.6 Learn text and string processing efficient algorithms.
COs.7 Learn searching techniques and use of pointers.
COs.8 Understand recursive techniques in programming

102: Calculus

COs.1 Assimilate the notions of limit of a sequence and convergence of a series of realnumbers.
COs.2 Calculate the limit and examine the continuity of a function at a point.
COs.3 Understand the consequences of various mean value theorems for differentiablefunctions.
COs.4 Sketch curves in Cartesian and polar coordinate systems.
COs.5 Apply derivative tests in optimization problems appearing in social sciences, physicalsciences, life sciences and a host of other disciplines.

103: Internet Technology*

COs.1 To understand the terms related to the Internet and how the Internet is changingthe world.
COs.2 To understand how computers are connected to the Internet and demonstrate the ability to use the World Wide Web.
COs.3 Demonstrate an understanding of and the ability to use electronic mail and other internet based services.
COs.4 Understand the design principles of Web pages and how they are created
COs.5 To develop skills and an ability to create basic Web pages with HTML.

104: English

COs.1 Appreciate the diversity of modern Indian literatures and the similarities betweenthem understand and creatively engage with the notion of nation and nationalism
COs.2 Appreciate the impact of literary movements on various Indian literatures
COs.3 Critically engage with significant social issues like caste and gender
COs.4 Understand the historical trajectories of Indian literatures

201: Computer System Architecture

COs.1 To make students understand the basic structure, operation and characteristics of digital computer.
COs.2 To familiarize the students with arithmetic and logic unit as well as the concept of the concept of pipelining.
COs.3 To familiarize the students with hierarchical memory system including cache memories and virtual memory.
COs.4 To make students know the different ways of communicating with I/O devices andstandard I/O interfaces.

202: Algebra and Geometry

COs.1 Understand the importance of roots of real and complex polynomials and learn various methods of obtaining roots.

COs.2 Familiarize with relations, equivalence relations and partitions.

COs.3 Employ De Moivre's theorem in a number of applications to solve numerical problems.

COs.4 Recognize consistent and inconsistent systems of linear equations by the row echelon form of the augmented matrix, using rank.

COs.5 Find eigenvalues and corresponding eigenvectors for a square matrix.

COs.6 Explain the properties of three-dimensional shapes

203: Mobile Application Development*

COs.1 To understand Android platform and its architecture.

COs.2 To learn about mobile devices types and different modern mobile operating systems.

COs.3 To learn activity creation and Android User Interface designing.

COs.1 To learn basics of Intent, Broadcast and Internet services.

COs.2 To learn about different wireless mobile data transmission standards.

COs.3 To understand and learn how to integrate basic phone features, multimedia, camera andLocation based services in Android Application.

COs.4 To learn about different systems for mobile application development, deployment anddistribution in Mobile market place (Android, IoS).

COs.5 To understand and carry out functional test strategies for mobile applications

204: Environment Science

COs.1 Knowledge of the environment and the role of human beings in shaping the environment

COs.2 Understand various components of the environment and interfaces

COs.3 Critically appreciate the environmental concerns of today

301: Data Structure and Algorithms

COs.1 To learn good principles of algorithm design;

COs.2 To learn how to analyse algorithms and estimate their worst-case and average case behavior (in easy cases);

COs.3 To become familiar with fundamental data structures and with the manner in which these data structures can best be implemented; become accustomed to the descriptionof algorithms in both functional and procedural styles;

COs.4 To learn how to apply their theoretical knowledge in practice (via the practical component of the course)

302: Mechanics

COs.1 Understand the role of vectors and coordinate systems in Physics.

COs.2 Write the expression for the moment of inertia about the given axis of symmetry fordifferent uniform mass distributions.

COs.3 Explain the conservation of energy, momentum, angular momentum and apply them tbasic problems.

COs.4 Understand the analogy between translational and rotational dynamics, and application of both motions simultaneously in analyzing rolling with slipping.

COs.5 Apply Kepler's law to describe the motion of planets and satellite in circular

orbit.

COs.6 Explain the phenomena of simple harmonic motion and the properties of systemsexecuting such motions.

COs.7 Describe how fictitious forces arise in a non-inertial frame, e.g., why a person sittingin a merry-go-round experiences an outward pull.

COs.8 Describe special relativistic effects and their effects on the mass and energy of amoving object

303: Data Mining*

COs.1 Demonstrate advanced knowledge of data mining concepts and techniques.

COs.2 Apply the techniques of clustering, classification, association finding, feature selection and visualisation on real world data

COs.3 Determine whether a real world problem has a data mining solution

COs.4 Apply data mining software and toolkits in a range of applications

COs.5 Set up a data mining process for an application, including data preparation, modellingand evaluation

COs.6 Demonstrate knowledge of the ethical considerations involved in data mining.

304: Programming in Java

COs.1 Knowledge of the structure and model of the Java programming language,

COs.2 Use the Java programming language for various programming technologies

COs.3 Develop software in the Java programming language,

COs.4 Evaluate user requirements for software functionality required to decide whether the Javaprogramming language can meet user requirements

401: Discrete Structure

COs.1 Understand the notion of mathematical thinking, mathematical proofs, and algorithmic thing and be able to apply them in problem solving.

COs.2 Understand the basics of combinatorics, and be able to apply the methods from thesesubjects in problem solving.

COs.3 Be able to use effectively algebraic techniques to analyse basic discrete structures andalgorithms.

COs.4 Understand asymptotic notation, its significance, and be able to use it to analyse asymptotic performance for some basic algorithmic examples.

COs.5 Understand some basic properties of graphs and related discrete structures, and be able torelate these to practical examples

402: Mathematical Physics

COs.1 Represent a periodic function by a sum of harmonics using Fourier series and their applications in physical problems such as vibrating strings etc.

COs.2 Obtain power series solution of differential equation of second order with variable coefficient using Frobenius method.

COs.3 Understand properties and applications of special functions like Legendre polynomials, Bessel functions and their differential equations and apply these to various physical problems such as in quantum mechanics.

COs.4 Learn about gamma and beta functions and their applications.

COs.5 Solve linear partial differential equations of second order with separation of variablemethod

403: Python Programming*

COs.1 Develop and execute simple Python programs.

COs.2 Structure a Python program into functions.

COs.3 Using Python lists, tuples to represent compound data

COs.4 Develop Python Programs for file processing

404: MATLAB Programming

COs.1 Understand the fundaments of procedural and functional programming

COs.2 Understand Matlab data types and structures

COs.3 Be able to set up simple real-life numerical problems such that they can be solved andvisualized using basic codes in Matlab

COs.4 Be ready to use advanced coding in Matlab in their subsequent studies

501: Database Management System

COs.1 Gain knowledge of database systems and database management systems software.

COs.2 Ability to model data in applications using conceptual modelling tools such as ER Diagrams and design data base schemas based on the model.

COs.3 Formulate, using SQL, solutions to a broad range of query and data update problems.

COs.4 Demonstrate an understanding of normalization theory and apply such knowledge to thenormalization of a database.

COs.5 Be acquainted with the basics of transaction processing and concurrency control.

COs.6 Familiarity with database storage structures and access techniques.

COs.7 Compare, contrast and analyse the various emerging technologies for database systems such as NoSQL.

COs.8 Analyse strengths and weaknesses of the applications of database technologies to various subject areas.

502 (A): Object OrientedProgramming**

COs.1 Learn the concepts of data, abstraction and encapsulation

COs.2 Be able to write programs using classes and objects, packages.

COs.3 Understand conceptually principles of Inheritance and Polymorphism and their useand program level implementation.

COs.4 Learn exception and basic event handling mechanisms in a program

COs.5 To learn typical object-oriented constructs of specific object oriented programminglanguage

502 (B): Image Processing**

COs.1 To familiarize the students with the image fundamentals and mathematical transforms necessary for image processing.

COs.2 To make the students understand the image enhancement techniques

COs.3 To make the students understand the image restoration and reconstruction procedures.

COs.4 To familiarize the students with the image segmentation procedures.

502(C): Data Analytics**

COs.1 This course prepares students to gather, describe, and analyse data, and use

advancedstatistical tools to support decision making.

COs.2 To gather sufficient relevant data, conduct data analytics using scientific methods, andunderstand appropriate connections between quantitative analysis and real world problems.

COs.3 Understand the exact scopes and possible limitations of each method to provideconstructive guidance in decision making.

COs.4 To Use advanced techniques to conduct thorough and insightful analysis, and interpretthe results correctly with detailed and useful information.

COs.5 To make better decisions by using advanced techniques in data analytics.

503: Web Programming

COs.1 To understand basics of the Internet and World Wide Web

COs.2 To acquire knowledge and skills for creation of web site considering both client andserver-side programming

COs.3 To learn basic skill to develop responsive web applications

COs.4 To understand different web extensions and web services standards

COs.5 To understand basic concepts of Search Engine Basics.

COs.6 To learn Web Service Essentials.

COs.7 To learn Rich Internet Application Technologies.

COs.8 To understand and get acquainted with Web Analytics 2.0

504: Field Project / Internship / Apprenticeship

601: Computer Network

COs.1 Understand the structure of Data Communications System and its components. Befamiliarizing with different network terminologies.

COs.2 Familiarize with contemporary issues in network technologies.

COs.3 Know the layered model approach explained in OSI and TCP/IP network models

COs.4 Identify different types of network devices and their functions within a network.

COs.5 Learn basic routing mechanisms, IP addressing scheme and internetworking concepts.

COs.6 Familiarize with IP and TCP Internet protocols.

COs.7 To understand major concepts involved in design of WAN, LAN and wirelessnetworks.

COs.8 Learn basics of network configuration and maintenance.

COs.9 Know the fundamentals of network security issues

602(A): System Security**

COs.1 Develop an understanding of information assurance as practiced in computer operating systems, distributed systems, networks and representative applications.

COs.2 Gain familiarity with prevalent network and distributed system attacks, defences against them, and forensics to investigate the aftermath.

COs.3 Develop a basic understanding of cryptography, how it has evolved, and some keyencryption techniques used today.

COs.4 Develop an understanding of security policies (such as authentication, integrity

andconfidentiality), as well as protocols to implement such policies in the form of message exchanges.

602(B): Computer Ethics**

COs.1 The student will be able to describe and distinguish between the various ethical theories which can be used to form the basis of solutions to moral dilemmas in computing.

COs.2 Identify traditional and current Issues related to Computers, Information Systems, Ethics, Society and Human Values;

COs.3 The student will be able to identify and define the components of a structured plan for solving ethical problems and, in the process, will be able to understand the basis for her/his own ethical system.

COs.4 Given several examples of professional codes of ethics related to computing, the student will be able to compare and contrast these examples, discussing their commonalties, differences, and implications.

COs.5 Develop skills of critical analysis and applying ethical principles to situations and dialectical thinking

602(C): Human Computer Interface**

COs.1 Provide an overview of the concepts relating to the design of human - computerinterfaces in ways making computer-based systems comprehensive, friendly and usable.

COs.2 Understand the theoretical dimensions of human factors involved in the acceptance of computer interfaces.

COs.3 Understand the important aspects of implementation of human-computer interfaces.

COs.4 Identify the various tools and techniques for interface analysis, design, and evaluation.

COs.5 Identify the impact of usable interfaces in the acceptance and performance utilization of information systems.

603 (A): Software Engineering**

COs.1 Basic knowledge and understanding of the analysis and design of complex systems.

COs.2 Ability to apply software engineering principles and techniques.

COs.3 To produce efficient, reliable, robust and cost-effective software solutions.

COs.4 Ability to work as an effective member or leader of software engineering teams.

COs.5 To manage time, processes and resources effectively by prioritizing competing demands to achieve personal and team goals Identify and analyzes the commonthreats in each domain.

603 (B): Modelling and Simulation**

COs.1 Characterize systems in terms of their essential elements, purpose, parameters, constraints, performance requirements, sub-systems, interconnections and environmental context.

COs.2 Understand the technical underpinning of modern computer simulation software.

COs.3 System problem modelling and solving through the relationship between theoretical, mathematical, and computational modelling for predicting and optimizing performance and objective.

COs.4 Mathematical modelling real world situations related to information systems development, prediction and evaluation of outcomes against design criteria.

COs.5 Develop solutions and extract results from the information generated in the context of the information systems

COs.6 Interpret the model and apply the results to resolve critical issues in a real world environment.

COs.7 Develop different models to suit special characteristics of the system being modelled

603(C): GIMP (GNU Image Manipulation Program**

COs.1 To familiarize the students with the underlying concepts of digital images.

COs.2 To make the students know how to enhance images and prepare them for printing andpublishing.

604: Field Project / Internship / Apprenticeship

701: Operating System

COs.1 Describe the important computer system resources and the role of operating system in their management policies and algorithms.

COs.2 To understand various functions, structures and history of operating systems and should be able to specify objectives of modern operating systems and describe how operating systems have evolved over time.

COs.3 Understanding of design issues associated with operating systems.

COs.4 Understand various processmanagement concepts including scheduling,synchronization, and deadlocks.

COs.5 To have a basic knowledge about multithreading.

COs.6 To understand concepts of memory management including virtual memory.

COs.7 To understand issues related to file system interface and implementation, disk management.

COs.8 To understand and identify potential threats to operating systems and the security featuresdesign to guard against them.

COs.9 To have sound knowledge of various types of operating systems including Unix and Android

COs.10 Describe the functions of a contemporary operating system with respect to convenience, efficiency, and the ability to evolve.

702 (A): Cloud Computing **

COs.1 Analyze the trade-offs between deploying applications in the cloud and over the local infrastructure.

COs.2 Compare the advantages and disadvantages of various cloud computing platforms.

COs.3 Deploy applications over commercial cloud computing infrastructures such as Amazon Web Services, Windows Azure, and Google AppEngine.

COs.4 Program data intensive parallel applications in the cloud.

COs.5 Analyze the performance, scalability, and availability of the underlying cloud technologies and software.

COs.6 Identify security and privacy issues in cloud computing.

COs.7 Explain recent research results in cloud computing and identify their pros and cons.

COs.8 Solve a real-world problem using cloud computing through group collaboration.

702 (B): System Programming**

COs.1 Understand basic concepts in systems programming.

COs.2 Understand basic concepts of microprocessors.

COs.3 Understand the concept of virtual machine.

COs.4 Develop skills to write programs using system services.

702 (C): Artificial Intelligence**

COs.1 Explain what constitutes "Artificial" Intelligence and how to identify systems withArtificial Intelligence.

COs.2 Identify problems that are amenable to solution by AI methods, and which AI methods may be suited to solving a given problem.

COs.3 Formalise a given problem in the language/framework of different AI methods (e.g.,as a search problem, as a constraint satisfaction problem, as a planning problem, etc).

COs.4 Implement basic AI algorithms (e.g., standard search or constraint propagationalgorithms).

COs.5 Design and perform an empirical evaluation of different algorithms on a problem formation, and state the conclusions that the evaluation supports.

COs.6 Explain the limitations of current Artificial Intelligence techniques.

702 (D): Internet of Things**

COs.1 To learn the concepts of Sensors, Wireless Network and Internet

COs.2 To learn and implement use of Devices in IoT technology.

COs.3 To learn the different IoT Technologies like Micro-controller, Wireless communication like Blue Tooth, GPRS, Wi-Fi and Storage and embedded systems

COs.4 To understand how to program on embedded and mobile platforms including differentMicrocontrollers like ESP8266, Raspberry Pi, Arduino and Android programming

COs.5 To understand how to make sensor data available on the Internet (data acquisition)and understand how to analyze and visualize sensor data

COs.6 To understand, analysis and evaluate different protocols used in IoT.

COs.7 To learn basic python programming for IoT applications

COs.8 To learn and design different applications in IoT.

COs.9 To design, develop and test different prototypes in IoT.

703: Research Methodology

COs.1 Students should know why educational research is undertaken, and the audiences that profit from research studies.

COs.2 Students should understand a general definition of research design.

COs.3 Students should be able to identify the overall process of designing a research studyfrom its inception to its report.

COs.4 Students should be familiar with ethical issues in educational

research, includingthose issues that arise in using quantitative and qualitative research.

COs.5 Students should know the primary characteristics of quantitative research andqualitative research.

COs.6 Students should be able to identify a research problem stated in a study.

COs.7 Students should be familiar with how to write a good introduction to an educationalresearch study and the components that comprise such an introduction.

704: Field Project / Internship / Apprenticeship

801: Theory of Computation (TOC)

COs.1 To provide a formal connection between algorithmic problem solving and the theory of languages and automata and develop them into a mathematical (abstract) view towards algorithmic design and in general computation itself.

COs.2 The course should in addition clarify the practical view towards the applications of these ideas in the engineering part as well.

COs.3 Become proficient in key topics of theory of computation, and to have the opportunity to explore the current topics in this area

802: Quantum Mechanics

COs.1 After an exposition of inadequacies of classical mechanics in explaining microscopic phenomena, quantum theory formulation is introduced through Schrodinger equation.

COs.2 The interpretation of wave function of quantum particle and probabilistic nature of its location and subtler points of quantum phenomena are exposed to the student.

COs.3 Through understanding the behavior of quantum particle encountering a i) barrier, ii) potential, the student gets exposed to solving non-relativistic hydrogen atom, for its spectrum and eigenfunctions.

COs.4 Study of influence of electric and magnetic fields on atoms will help in understanding

COs.5 Stark effect and Zeeman Effect respectively. The experiments using Sci-lab will enable the student to appreciate nuances involved inthe theory.

COs.6 This basic course will form a firm basis to understand quantum many body problems

803: Field Project / Internship / Apprenticeship or ResearchProject

Programme – B.Sc. (Hon) Computer Science (OLD)

Programme Outcomes

POs.1 To understand both the theoretical and practical concepts of Computer Science.

POs.2 To gain programming skill to provide solutions for real world problems.

POs.3 To gather a better understanding to analyze, design and development of software systems.

Programme Specific Outcomes

PSOs.1 Demonstrate understanding of the principles and concepts of the computer systems to develop efficient computing system.

PSOs.2 Analyze, design, develop, implement and test computer programmes for providing solutions for computing problems.

PSOs.3 Enhancing skills and learning new computing technologies for attaining professional excellence and research.

PSOs.4 Design and develop computer programs/computer-based systems in the areas related to algorithms, networking, web design and data analytics of varying complexity.

PSOs.5 Acquaint with the contemporary trends in industrial/research and thereby bring forth novel solutions to existing problems.

BSCSH-101-Foundation course-I (English)

BSCSH-102-Programming fundamentals using C

COs.1 Illustrate the fundamentals of programming languages.

COs.2 To become skilled at developing simple algorithms.

COs.3 Analyze different data types and arrays

COs.4 To learn about array, functions and Pointers.

BSCSH-103 Computer System Architecture

COs.1 Understanding of digital system, its organization and architecture.

COs.2 Apply knowledge of digital electronics logic gate to combinational and sequential circuits.

COs.3 Knowledge of the basics of computer hardware and how software interacts with computer hardware.

COs.4 Apply concepts of assembly language in solving problems.

COs.5 Illustrate the concept of processing I/O organization and examine different ways of communicating with I/O devices and standard I/O interfaces.

BSCSH-104-Maths's I-Calculus and linear algebra

COs.1 Assimilate the notions of limit of a sequence and convergence of a series of real numbers.

COs.2 Calculate the limit and examine the continuity of a function at a point.

COs.3 Understand the consequences of various mean value theorems for differentiable functions.

COs.4 Understand the importance of roots of real and complex polynomials and learn various methods of obtaining roots.

COs.5 Familiarize with relations, equivalence relations and partitions.

COs.6 Employ De Moivre's theorem in a number of applications to solve numerical problems.

COs.7 Recognize consistent and inconsistent systems of linear equations by the row echelon form of the augmented matrix, using rank.

BSCSH-105-Physics I- mechanics and properties of matters

COs.1 Understand the role of vectors and coordinate systems in Physics.
COs.2 Write the expression for the moment of inertia about the given axis of symmetry for different uniform mass distributions.
COs.3 Explain the conservation of energy, momentum, angular momentum and apply them to basic problems.
COs.4 Understand the analogy between translational and rotational dynamics, and application of both motions simultaneously in analyzing rolling with slipping.

BSCSH-201-Foundation course-II (Basic of Computer and Information Technology)

COs.1 Bridge the fundamental concepts of computers with the present level of knowledge of the students.
COs.2 Familiarise operating systems, programming languages, peripheral devices, networking, multimedia and internet
COs.3 Understand binary, hexadecimal and octal number systems and their arithmetic.
COs.4 Understand how logic circuits and Boolean algebra forms as the basics of digital computer.
COs.5 Demonstrate the building up of Sequential and combinational logic from basic gates.

BSCSH-202-Internet technology

COs.1 To understand basics of the Internet and World Wide Web
COs.2 To acquire knowledge and skills for creation of web site considering both client and server-side programming
COs.3 To learn basic skill to develop responsive web applications
COs.4 To understand different web extensions and web services standards
COs.5 To understand basic concepts of Search Engine Basics.
COs.6 To learn Web Service Essentials.
COs.7 To learn Rich Internet Application Technologies.

BSCSH-203-Data structure

COs.1 To be familiar with fundamental data structures and with the manner in which these data structures can best be implemented; become accustomed to the description of algorithms in both functional and procedural styles
COs.2 To have knowledge of complexity of basic operations like insert, delete, search on these data structures.
COs.3 Ability to choose a data structure to suitably model any data used in computer applications.
COs.4 Design programs using various data structures including hash tables, Binary and general search trees, heaps, graphs etc.
COs.5 Ability to assess efficiency tradeoffs among different data structure implementations.

BSCSH-204-Math's II- Calculus and geometry

COs.1 Apply mathematical geometry and logic to solve complex problems in the domain of mathematics.
COs.2 Understand the consequences of various mean value theorems for differentiable functions.
COs.3 Sketch curves in Cartesian and polar coordinate systems.
COs.4 Apply derivative tests in optimization problems appearing in social sciences, physical sciences, life sciences and a host of other disciplines.

BSCSH-205-physics II-Thermodynamics and statistical physics

COs.1 Explain the fundamentals of thermodynamics, Carnot cycle, statistics and distributions.
COs.2 Grasp the basis of ensemble approach in statistical mechanics to a range of situations.
COs.3 Explain the fundamental differences between classical and quantum statistics and learn about quantum statistical distribution laws.
COs.4 Analyze important examples of ideal Bose systems and Fermi systems.
COs.5 Discuss various phenomena in solids using statistical mechanics.
COs.6 Develop and apply using model and mean field theory for first and second order phase transitions.

BSCSH-301-Foundation Course-III (Hindi Bhasha)

COs.1 Understanding the origin of Hindi language and its literature.
COs.2 Identifying the dialects of Hindi language family.
COs.3 Analysing the development of Khariboli Hindi.
COs.4 Understanding the concept of history of literature.
COs.5 Understanding the basis of the classification of Hindi literature.
COs.6 Understanding the importance and basis of the names given to each period of Hindi literature.
COs.7 Understanding the features of Adikal, Bhakti kal, Ritikal and Adhunikkal, in context of socio - cultural and political condition of that period.
COs.8 Identifying the eminent Hindi writers of each period.
COs.9 Understanding the reason of emergence of Adhunikkal in Hindi literature.
COs.10 Understanding the literary trends of Adhunik kal.
COs.11 Understanding the history of development of Hindi drama, short stories and novels.
COs.12 Understanding the discourse of women and dalits in Hindi literature.

BSCSH-302-Computer networks

COs.1 Learn data transmission models, modulation, multiplexing.
COs.2 Understand applications of layers such as application layer, transport layer, network layer, data link layer.
COs.3 Understand the importance of network security and management by analyzing different threats, principles of cryptography, digital signature, and internet network management framework.

BSCSH-303-Database management system and SQL

COs.1 Understand concepts of database system architecture.
COs.2 Able to understand relational model and perform SQL operations.
COs.3 Understand the importance of normal forms and learn query optimization.
COs.4 Learns the importance of transaction processing and concurrency control.
COs.5 Learn the concept of data warehousing and data mining.

BSCSH-304-Math's III- Basic Probability and Statistics

COs.1 Analyze statistical data graphically using frequency distributions and cummulative frequency distributions.
COs.2 Analyze statistical data using measures of central tendency, dispersion and location.
COs.3 Use the basic probability rules, including additive and multiplicative laws, using the terms, independent and mutually exclusive events.
COs.4 Translate real-world problems into probability models.
COs.5 Derive the probability density function of transformation of random variables.
COs.6 Calculate probabilities, and derive the marginal and conditional distributions of bivariate random variables.

BSCSH-305-Physics III-Optics

COs.1 Gain knowledge on various theories of light
COs.2 Acquire skills to identify and apply formulas of optics and wave physics
COs.3 Understand the properties of light like reflection, refraction, interference, diffraction etc
COs.4 Understand the applications of diffraction and polarization.
COs.5 Understand the applications of interference in design and working of interferometers.
COs.6 Understand the resolving power of different optical instruments.
COs.7 Gain knowledge on working of holography and their applications in various fields.
COs.8 Gain knowledge in optical fiber and their applications in communication

BSCSH-401-Foundation course-IV (Environmental Studies)

COs.1 Master core concepts and methods from ecological and physical sciences and their application in environmental problem solving.
COs.2 Master core concepts and methods from economic, political, and social analysis as they pertain to the design and evaluation of environmental policies and institutions.
COs.3 Appreciate the ethical, cross-cultural, and historical context of environmental issues and the links between human and natural systems.
COs.4 Understand the transnational character of environmental problems and ways of addressing them, including interactions across local to global scales.
COs.5 Apply systems concepts and methodologies to analyze and understand interactions between social and environmental processes.

COs.6 Reflect critically about their roles and identities as citizens, consumers and environmental actors in a complex, interconnected world.

BSCSH-402-Software engineering

COs.1 Able to apply the concepts of software engineering which is essentially important while working on big modules and or projects.
COs.2 Understand the concept of system and able to analyse its feasibility study.
COs.3 Understand software process framework, requirement modelling approaches, software design, and software quality.
COs.4 Able to apply software metrics and software testing.

BSCSH-403-Discrete mathematics

COs.1 Prepare to develop mathematical logic essentially required in complex programming.
COs.2 Able to learn and apply set theory, algebraic structures, lattices and Boolean algebra, graph theory.
COs.3 Able to troubleshoot fault detection in combinational switching circuits.
COs.4 Understand and able to apply learns to analyse algorithms for generating a fault matrix.

BSCSH-404-Maths IV- Real Analysis and differential equations

COs.1 To achieve knowledge and understanding of sets, their various properties and capabilities to solve wide range of problems in science and engineering.
COs.2 To get familiar with concepts of cardinal numbers and develop ability to solve simple and complex problems.
COs.3 To understand Rings and their applications in mathematical sciences.
COs.4 To learn basic concepts of Differentiations and Integrations.
COs.5 To acquire knowledge of Convergence series.
COs.6 Ability to acquire knowledge of ordinary differential equations.

BSCSH-405-Physics IV- Quantum Mechanics and solid state

COs.1 Understand properties and applications of special functions like Legendre polynomials, Bessel functions and their differential equations and apply these to various physical problems such as in quantum mechanics.
COs.2 Learn about gamma and beta functions and their applications.
COs.3 Solve linear partial differential equations of second order with separation of variable method

BSCSH-501-Foundation course V (Entrepreneurship Development)

COs.1 Demonstrate a fundamental comprehension of business opportunity evaluation, from the perspective of a prospective investor.
COs.2 Identify the most recognized sources of potential funding and financing for business start-ups and/or expansion.

COs.3 Demonstrate basic computer proficiency, including the use of word processing, presentation, and spreadsheet software packages, as well as a basic facility with the internet and other research tools.

COs.4 Demonstrate extemporaneous speaking skills developed through in-class discussion of text materials, case study analyses, and current entrepreneurship-related issues.

COs.5 Assess their own personal work product(s) - and critique those of their colleagues - with regard to thoroughness, creativity and how those could apply to their own real life, future business ventures.

BSCSH-502-Java programming

COs.1 Learn Java programming language which can be utilized to develop windows and internet based software solutions.

COs.2 Able to understand and apply the knowledge of object-oriented principles, applets, graphical user-interface for scientific and business oriented applications.

BSCSH-503-System programming

COs.1 Understand basic concepts in systems programming.

COs.2 Understand basic concepts of microprocessors.

COs.3 Understand the concept of virtual machine.

COs.4 Develop skills to write programs using system services.

BSCSH-504-Cloud Computing

COs.1 Analyse the trade-offs between deploying applications in the cloud and over the local infrastructure.

COs.2 Compare the advantages and disadvantages of various cloud computing platforms.

COs.3 Deploy applications over commercial cloud computing infrastructures such as Amazon Web Services, Windows Azure, and Google AppEngine.

COs.4 Program data intensive parallel applications in the cloud.

COs.5 Analyze the performance, scalability, and availability of the underlying cloud technologies and software.

COs.6 Identify security and privacy issues in cloud computing.

COs.7 Explain recent research results in cloud computing and identify their pros and cons.

COs.8 Solve a real-world problem using cloud computing through group collaboration

BSCSH-505-Design and analysis of algorithm

COs.1 Learn to compute the time and space complexity of a given algorithm and analyse the efficiency of algorithms.

COs.2 Learns the utilization of different prototypes of problem solving to solve a given problem.

COs.3 Understand and analyse greedy algorithms, dynamic programming, concepts of tractable and intractable problems.

COs.4 Understand the class of P, NP and NP-complete problems.

BSCSH-601-Theory of computation

COs.1 Use concepts of formal languages of finite automata techniques.

COs.2 Design Finite Automata's for different regular expressions and languages.

COs.3 Construct context free grammar for various languages.

COs.4 Solve various problems of applying normal form techniques, push down automata and Turing Machines.

BSCSH-602-Computer Graphics

COs.1 Apply mathematical geometry and logic to develop Computer programs for elementary graphics operations and to develop scientific and strategic approach to solve complex problems in the domain of Computer Graphics.

COs.2 Demonstrate an understanding of contemporary graphics hardware.

COs.3 Ability to draw graphics using line & polygon and ability to perform operations on computer graphics.

COs.4 Understand and demonstrate geometrical transformations, Segment, Windowing and Clipping, Interaction.

COs.5 Understand and demonstrate 2D & 3D image processing techniques.

COs.6 Understand and demonstrate Hidden Surfaces & Lines; Light, Colour& Shading; Curves and Fractals

BSCSH-603-.Net programming

COs.1 To understand the concept of .Net Framework to introduce .Net framework

COs.2 Constant, variable, operators, constructor, looping and array to learn programming skill. To learn basic syntax of VB.

COs.3 Working with controls to understand various control, properties and events. To develop application using controls.

COs.4 With with Activex control and Menus To understand the use of active control To learn how to create menus and submenus

COs.5 Working with database to learn connectivity between .Net front end and database.

COs.6 To understand report generation using Data Environment.

BSCSH-604-Operating system

COs.1 Analyze & Classify different types of operating system.

COs.2 Understand the working of Operating system.

COs.3 Understand the Memory Management policies.

COs.4 Concepts of input/output, storage and file management.

COs.5 Understand various protection and security mechanisms

Mapping

B.Sc. (Hons) Computer Science

Correlation Level

Level	Ranks
High (Substantially)	3
Medium (Moderately)	2
Low (Slightly)	1

Course Code	Course Outcomes	POs.1	POs.2	POs.3	POs.4	POs.5	POs.6
101	COs.6	3	2	3	3	3	2
	COs.7	3	2	2	2	1	3
	COs.8	2	3	2	3	3	2
	COs.9	3	2	2	2	2	3
	COs.10	2	1	1	3	3	1
	COs.11	1	2	2	3	2	2
102	COs.4	3	3	3	2	3	2
	COs.5	2	2	2	3	3	3
	COs.6	3	1	1	3	2	2
	COs.7	1	2	3	2	2	2
	COs.8	3	2	3	3	3	2
103	COs.5	2	3	1	2	3	
	COs.6	2	2	1	2	2	
	COs.7	3	3	2	2	2	
	COs.8	3	2	2	2	2	
	COs.9	2	1	2	3	2	
104	COs.3	2	3	3	3		
	COs.4	2	2	3	3		
	COs.5	3	3	3	1		
	COs.6	2	2	3	2		
201	COs.3	3	2	2	3		
	COs.4	3	3	1	1		
	COs.5	2	2	3	3		
	COs.6	3	3	2	1		
202	COs.3	3	3	1	2	3	1
	COs.4	2	3	3	3	2	3
	COs.5	3	1	1	3	2	2
	COs.6	2	2	2	3	3	2
	COs.7	3	3	2	1	2	2
	COs.8	3	1	1	3	2	2
203	COs.3	2	1	3	2	3	1
	COs.4	3	2	1	1	1	2
	COs.5	2	3	3	3	2	3
	COs.6	1	1	2	1	3	3
	COs.7	2	3	3	3	2	3
204	COs.4	3	3	2			

	COs.5	3	3	2			
	COs.6	2	2	2			
BSCSH-301	COs.2	3	3	1	3		
	COs.3	1	2	3	2		
	COs.4	2	1	2	2		
	COs.5	3	3	2	3		
BSCSH-302	COs.4	3	2	2	1	1	3
	COs.5	2	2	1	2	3	1
	COs.6	2	2	3	3	1	3
	COs.7	1	3	2	1	2	3
	COs.8	3	1	1	2	3	2
	COs.9	2	1	2	2	2	2
	COs.10	3	3	2	2	3	2
BSCSH-303	COs.3	2	2	3	3		
	COs.4	2	2	2	3		
	COs.5	1	2	1	1		
	COs.6	1	2	1	2		
BSCSH-304	COs.4	3	2	3	1		
	COs.5	3	3	3	1		
	COs.6	2	3	3	3		
	COs.7	3	2	1	2		
BSCSH-305	COs.4	3	3	3	2	1	3
	COs.5	3	3	3	1	2	2
	COs.6	3	2	3	1	2	3
	COs.7	2	2	3	3	1	3
	COs.8	3	3	2	2	3	2
BSCSH-401	COs.4	2	2	3	1	1	
	COs.5	2	2	3	1	2	
	COs.6	3	3	3	3	2	
	COs.7	1	1	2	2	3	
	COs.8	2	2	3	2	3	
BSCSH-402	COs.5	3	3	3	3	3	
	COs.6	3	2	2	3	2	
	COs.7	3	3	1	3	2	
	COs.8	3	3	3	3	2	
	COs.9	2	2	1	2	3	
BSCSH-403	COs.4	2	2	2	3		
	COs.5	2	2	1	3		
	COs.6	3	3	1	2		
	COs.7	1	2	2	1		
BSCSH-404	COs.4	2	3	3	2		
	COs.5	3	2	3	1		
	COs.6	3	3	3	2		
	COs.7	2	2	3	2		
BSCSH-405	COs.5	3	1	3	1		
	COs.6	3	3	3	3		
	COs.7	2	3	1	3		
	COs.8	3	2	3	3		
BSCSH-501	COs.1.	2	2	3	3	1	

	COs.2.	2	2	2	3	3	
	COs.3.	3	3	3	2	1	
	COs.4.	3	3	3	1	2	
	COs.5.	3	3	3	2	1	
BSCSH-502	COs.1.	3	3	3	1	2	
	COs.2.	2	2	3	3	1	
	COs.3.	3	1	1	3	2	
	COs.4.	2	2	2	3	3	
	COs.5.	3	1	1	3	2	
BSCSH-503	COs.1.	2	3	2	1	1	
	COs.2.	1	3	2	2	2	
	COs.3.	2	2	3	3	2	
	COs.4.	3	3	3	2	2	
	COs.5.	2	2	2	3	3	
BSCSH-505	COs.1.	3	3	3	2	3	2
	COs.2.	2	2	2	3	3	3
	COs.3.	3	3	3	2	3	2
BSCSH-601	COs.1.	2	2	2	3	3	3
	COs.2.	3	3	3	2	3	2
	COs.3.	3	2	3	2	3	2
	COs.4.	2	2	2	3	3	2
	COs.5.	3	2	3	1	2	1
	COs.6.	3	2	3	1	2	1
BSCSH-602	COs.1.	2	2	3			
	COs.2.	3	3	3			
	COs.3.	2	2	3			
BSCSH-603	COs.1.	3	1	2	3		
	COs.2.	1	2	3	1		
	COs.3.	3	1	2	3		
	COs.4.	1	2	3	2		
BSCSH-604	COs.1.	3	1	2	3		
	COs.2.	2	2	2	3		
	COs.3.	1	3	3	2		
	COs.4.	2	2	3	2		
BSCSH-605	COs.1.	3	1	3	2		
	COs.2.	1	3	2	2		
	COs.3.	3	2	3	1		

Programme – M.Sc. (Computer Science)

Successful completion of M.Sc. (Computer Science) a student should be able to:

Programme Outcomes

POs.1	To understand both the theoretical and practical concepts of Computer Science.
POs.2	To gain programming skill to provide solutions for real world problems.
POs.3	To gather a better understanding to analyze, design and development of software systems.
POs.4	To build a foundation for academics and research in Computer Science.

Programme Specific Outcomes

PSOs.1	Demonstrate understanding of the principles and concepts of the computer systems to develop efficient computing system.
PSOs.2	Analyze, design, develop, implement and test computer systems for providing solutions for computing problems.
PSOs.3	Enhancing skills and learning new computing technologies for attaining professional excellence and research.
PSOs.4	Design and develop computer programs/computer-based systems in the areas related to algorithms, networking, web design and data analytics of varying complexity.
PSOs.5	Acquaint with the contemporary trends in industrial/research and thereby bring forth novel solutions to existing problems.
PSOs.6	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

Course Outcomes

MSCS-101- Discrete Mathematics

COs.1	Analyze Properties of Algebraic Structures Such as Groups, Rings and Fields.
COs.2	Apply the Operations of Sets and use Venn Diagrams to Solve Applied Problems;
COs.3	Use and Analyze Recursive Definitions
COs.4	Understand, Explain and Apply the Basic Principles of Sets and Operations in Sets to Solve the Problems
COs.5	Analyze Modern Problems in Computer Science and solve them Using Graphs and Trees.

MSCS-102- Computer System Architecture

COs.1	Understand and Represent Data in Different Binary Formats
COs.2	Design Simplify and evaluate Boolean Equations and Circuits
COs.3	Explain and Analyse Basic Building Blocks of Digital Electronics and Computer
COs.4	Design and Analyse Simple Combination & Sequential Circuits

COs.5 Analyse the Basic Computer Organisation and Programming

COs.6 Understand the Organisation of I/O Devices and Computer Memory Mapping.

MSCS-103- (A) Data Structure Using-C

COs.1 Explain the Basic Terminology Used in Computer Programming.

COs.2 Explain the Process of Problem Solving Using C Programming Language.

COs.3 Write Compile and Debug Programs in C Language.

COs.4 Analyze and Solve Complex and Real Life Problems by Developing Application Programs using C Programming Language.

COs.5 Understand and explain Basic Data Structures Such as Linked Lists Stacks and Queues Tree and Graph.

COs.6 Select and apply Appropriate Data Structures to define the particular Problem statement.

COs.7 Implement Operations Like Searching/Sorting Insertion and Deletion Traversing on Various Data Structures.

COs.8 Determine and Analyze the Complexity of Given Algorithms

MSCS-103- (B) Web Technology

COs.1 Describe the concepts of WWW including Browser and HTTP Protocol.

COs.2 ListtheVariousHTMLTagsandusethemtodeveloptheUserFriendlyWebPages.

COs.3 Define the CSS with its Types and use them to provide the Styles to the Web Pages at Various Levels.

COs.4 DeveloptheModernWebPagesusingtheHTMLandCSSFeatureswithdifferentlay outsas per Need of Applications.

COs.5 Use the Java script to develop the dynamic WebPages.

COs.6 Use Server Side Scripting with PHP to Generate the Web Pages dynamically using the Database Connectivity.

COs.7 Develop the Modern Web Applications using the Client and Server Side Technologies and the Web Design Fundamentals.

MSCS-104-(A) Numerical Methods

COs.1 Understand and analyze the real problems and formulate them into linear and non-linear Equations.

COs.2 Gain the knowledge of various Optimization Techniques for finding the solutions of Non-Linear and Linear Equations.

COs.3 Optimize the solutions by iteratively carrying out Error Analysis for Arithmetic Operations.

COs.4 Understand and explain the Propagation of Errors with the help of Complex Numerical Algorithms.

COs.5 Understand the usage of Interpolation techniques for Numerical Differentiation and Integration.

MSCS- 104-(B) E-Commerce and E- Governance

COs.1 Explain and demonstrate E-Governance Initiatives at the National Level in India

COs.2 Make Classification of E-Commerce and E- Governance

COs.3 Students Able to Think Critically and Analytically to New Successful Business Ideas.

MSCS-105- DBMS (Database Management System)

COs.1 Understand and describe the basic concepts and terminology of Database Management System.

COs.2 Analyze and Design the database of applications using ER modelling and Normalization.

COs.3 Demonstrate the database schema data modelling and normalization process with the help of example.

COs.4 Implement the database design using appropriate database tools.

COs.5 Describe the transaction processing system locking techniques and data recovery.

MSCS-201- System Software

COs.1 Understand different components of system software.

COs.2 Understand intermediate code generation in context of language designing.

COs.3 Recognize operating system functions such as memory management as pertaining to run time storage management.

MSCS-202- Software Engineering

COs.1 Identify Analyze Review and Validate the Requirement of Software Components and System and Also Prepare Software Requirement Specification (SRS) Document Using Relevant Standards Tools and Methodologies.

COs.2 Manage a Software Project by Applying Project Management Concepts Such as Planning

COs.3 Scheduling and Risk Management for Developing Qualitative and Economic Software.

COs.4 Work Effectively in Various Profiles of Software Developing Team Such as Software Analyst

COs.5 Architecture Programmer Tester Quality Assurance and Control officer Project Manager and Leaders.

COs.6 Communicate and Coordinate Competently by Listening Speaking Reading and Writing Software Documents

COs.7 Apply Coding Standards & Guidelines and Quality Norms in Coding of Software Systems to Satisfy the Requirements and Quality.

COs.8 Design Test Cases and Optimize the Test Suite for Unit Integration and System-Level Testing Using Various Techniques and Tools for Adequately Testing the Software Components and Systems.

MSCS-203- (A) Object Oriented Programming

COs.1 Explain Concepts and Advantages of Object Oriented Programming.
COs.2 Apply and implement the concepts of the Object-Oriented paradigms to analyze design and develop the solutions of real world problems using the Principles of information Hiding Localization and Modularity.
COs.3 Design Develop and maintain the small applications system utility for societal and academic problems using reusability concepts in team spirit.
COs.4 Demonstrate the Advanced Features of C++ Specifically Stream I/O Templates and Operator Over loading and Overriding.

MSCS-203- (B) Programming in Python

COs.1 Install and use Python on Various Platform.
COs.2 Understand and Explain the features of Python language
COs.3 Design and Develop Python applications for data analysis using object-oriented concept.
COs.4 Build package and modules in Python with reusability and exception Aspect
COs.5 Write programs for Reading and Writing files in Python.

MSCS- 204-(A) Computer Network

COs.1 Demonstrate the Basic Concepts of Networking Principles Routing Algorithms, IP Addressing and Working of Networking Devices.
COs.2 Demonstrate the Significance Purpose and application of Networking Protocols and Standards.
COs.3 Describe compare and contrast LAN WAN MAN Intranet Internet AM FM PM and Various Switching Techniques.
COs.4 Explain the working of Layers and apply the various protocols of OSI & TCP/IP model.
COs.5 Analyze the Requirements for a Given Organizational Structure and Select the Most Appropriate Networking Architecture and Technologies.
COs.6 Design the Network Diagram and Solve the Networking Problems of the Organizations with Consideration of Human and Environment.
COs.7 Install and Configure the Networking Devices.

MSCS- 204-(B) Big Data Analysis

COs.1 Ability to identify the characteristics of datasets and compare the trivial data and big data for various applications.
COs.2 Demonstrate an ability to use Hadoop framework to efficiently store retrieve and process Big Data for Analytics.
COs.3 Implement several Data Intensive tasks using the Map Reduce Paradigm

MSCS-205- Advanced Programming Language

COs.1 Understand and explore various Features of .Net Framework

COs.2 Analyze, Design and Develop the GUI based Applications software using Vb.Net and C#

COs.3 Design, Develop and Implement Complete software Projects using Vb.Net and C# with consideration of Environment in team spirit.

COs.4 Analyze the requirement, design and develop Dynamic and Static Websites and Web applications using .Net technology.

COs.5 Integrate and Apply Different Components Including Database, XML with Proper Choice of Languages Mapping

MSCS-301- Operating System

COs.1 Identify and describe the Services Provided by Operating Systems.

COs.2 Understand and Solve the Problems Involving Process Control Mutual Exclusion

COs.3 Synchronization and Deadlock.

COs.4 Apply Various Approaches of Memory Management

COs.5 Analyze Various Operating System Approaches in Linux and Windows

MSCS-302- Computer Graphics & Multimedia

COs.1 Student will be able to implement the basic concepts and learn the various algorithms to scan, convert the basic geometrical primitives, transformations, area filling, clipping, viewing,

COs.2 Develop Understanding of Technical Aspect of Multimedia Systems. Also To Understand and explain the storage mechanism and applicability of Various File Formats for Audio Video and Text Media.

COs.3 Develop the Various Multimedia Systems Applicable in Real Time.

COs.4 Create a Multimedia Component Using Various Tools and Techniques.

COs.5 Apply the Guidelines and Standards of Multimedia Systems and to analyze the performance of Multimedia System.

MSCS-303- (A) Theory of Computation

COs.1 The student will be able to analyze and compare different computational models.

COs.2 Demonstrates Models, Turing Machine, Regular Expression, Push down Automaton.

COs.3 Apply and Prove properties of Languages, Grammars and Automata.

COs.4 Apply Knowledge of Computing and Mathematics to Solve Problem

COs.5 Apply Mathematical Foundations, Algorithmic Principles and Computer Science Theory to the Modelling.

COs.6 To identify the limitations of some computational models and possible methods of proving them.

MSCS-303- (B) AI & Machine Learning

COs.1 Demonstrate and Apply Artificial Intelligence Techniques, Various Types of Production Systems, and Characteristics of Production Systems.

COs.2 Design Neural Networks Architecture and Implement Functions and Various Algorithms Involved.
COs.3 Fuzzy Logic, Various Fuzzy Systems and their Functions.
COs.4 Genetic Algorithms, its Applications and Advances
COs.5 Able to Analyse and Design Expert Systems through Learning the Machine

MSCS-304-(A) Advanced Computer architecture

COs.1 Understand different processor architectures and system-level design processes.
COs.2 Understand the principles of I/O in computer systems, including viable mechanisms for I/O and secondary storage organization.
COs.3 Understand different processor architectures and system-level design processes

MSCS-304-(B) Information & Network Security

COs.1 Explain the Principles of Cryptography and Cryptanalysis Including Symmetric and Asymmetric Encryption, Hashing, and Digital Signatures.
COs.2 Explain the Fundamental Notions of Threat, Vulnerability, Attack and Countermeasure.
COs.3 Be able to Identify the Security Goals of an Information System, Point Out Contradictory Goals and Suggest Compromises.
COs.4 Identify and Classify Particular Examples of Attacks.
COs.5 Implement the Various Security Algorithms.

MSCS-305- Java Programming

COs.1 Explain and apply the Object Oriented Concepts for Solving Real Problem.
COs.2 Use the Java SDK Environment to Create Debug and Run Simple Java Programs.
COs.3 Apply Java Technology to Develop the Small Applications Utilities and Web Applications.
COs.4 Apply Event Management and Layout Managers Using AWT Swing JDBC and Servlet for Developing the Software for Various Problems.

MSCS-401-Major Project/Dissertation External Evaluation

COs.1 Identify the problem by applying acquired knowledge.
COs.2 Analyze and categorize executable project modules after considering risks.

MSCS-402-Major Project/Dissertation Internal Evaluation

COs.1 Choose efficient tools for designing project modules.
COs.2 Combine all the modules through effective team work after efficient testing.
COs.3 Elaborate the completed task and compile the project report.

Programme- PGDCA

Programme Outcomes

POs.1 The Goal of Program to prepare for all computer Knowledge and Languages in one year.

POs.2 Analyze the System and maintain the relationship.

POs.3 Different hardware & software specification which will be computer.

POs.4 Understanding application of Different software needed for rular areas development.

POs.5 To identify , software engineering, networking, hardware knowledge,

POs.6 To utilize the techniques, skills &modern programming tools, software development practice.

POs.7 Effective Computer Skills And development personality

Program Specific Outcome

PSOs.1 Understand Basic concept, and Programming language like procedure oriented language, Object oriented programming, event driven programming.

PSOs.2 Different Hardware and software specification.

PSOs.3 Understanding application of different software. Needed for area development like shakari sanstha online treading, institute

PGDCA-101- Computer Fundamentals

COs.1 Use and identify various art (input output devices) of computer system.

COs.2 Explain functions of various parts and function of computer.

COs.3 Use Linux operating system and create files and folders. Explain Software Hardware Components of Computer system.

PGDCA -102-(A) Programming in "C"

COs.1 Explain the Basic Terminology Used in Computer Programming

COs.2 Explain the Process of Problem Solving Using Programming Language.

COs.3 Write Compile and Debug Programs in Language.

COs.4 Analyze and Solve Complex and Real Life Problems by Developing Application Programs using C Programming Language

PGDCA -102-(B) Multimedia Application

COs.1 Develop Understanding of Technical Aspect of Multimedia Systems

COs.2 Understand and explain the storage mechanism and applicability of Various File Formats for

COs.3 Audio, Video and Text Media Develop Various Multimedia Systems Applicable in Real Time

COs.4 Create a Multimedia Component Using Various Tools and Techniques.

COs.5 Apply the Guidelines and Standards of Multimedia Systems and to Analyze the performance of Multimedia System

PGDCA-103-(A) Analysis and Design of Information System

COs.1 Explain the Characteristics, Components, Activities of SDLC, Models of Information Systems, Types of Information Systems and Benefits of Various Information Systems Identify, Analyze, Review and Validate the Requirement of Information System and Also Prepare System Requirement Specification (SRS) Document.

COs.2 Design, Develop Implement, Deploy and Evolve the Efficient, Reliable, Robust, and Cost Effective Information System

COs.3 Apply Universal Modelling Language (UML) to Analyze and Model the Solutions of Information System Problems

COs.4 Work Effectively in Various Roles of System Analyst Such as Problem Investigator Communicators, System Designer, Tester, Project Manager and Maintenance Engineer

PGDCA-103-(B) E-Commerce and E-Governance

COs.1 Explain and demonstrate E-Governance Initiatives at the National Level in India

COs.2 Make Classification of E-Commerce and E-Governance

COs.3 Students Able to Think Critically and Analytically to New Successful Business Ideas

PGDCA-104-Office Automation S/W Tools

COs.1 Creating Word Documents for office use Knowledge of Mail Merge

COs.2 Use of Formatting Techniques and Presentation Styles Provide Professional Services to the Society

COs.3 Create Presentation Using Animation and Transition and other features.

COs.4 Construct Formulas Including the use of Built-in Functions and Relative and Absolute

COs.5 References and Create and Modify Charts and Preview and Print Worksheets

PGDCA-201-(A) Java Programming

COs.1 Explain and Apply the Object Oriented Concepts for Solving Real Problem. Use the Java 5DK Environment to Create, Debug and Run Simple Java Programs.

COs.2 Apply Java Technology to Develop the Small Applications, Utilities, and Web Applications

COs.3 Apply Events Management and Layout Managers Using AWT. Swing JDBC and Servlet for Developing the Software for Various Problems.

PGDCA-201-(B) Web Technology

COs.1 Describe the concepts of WWW including Browser and HTTP Protocol.

COs.2 List the Various HTML Tags and use them to develop the User Friendly WebPages Define the CSS with its Types and use them to provide the Styles to the Web Pages at Various Levels Develop the Modern Web Pages using the HTML and CSS Features with different layouts as per Need of Applications Use the Java script to develop the dynamic WebPages.

COs.3 Use Server Side Scripting with PHP to Generate the Web Pages dynamically using the Database Connectivity

COs.4 Develop the Modern Web Applications using the Client and Server Side Technologies and the Web Design Fundamentals

PGDCA-202-(A) Computer Network

COs.1 Demonstrate the Basic Concepts of Networking. Networking Principles Routing Algorithms IP

COs.2 Addressing and Working of Networking Devices

COs.3 Demonstrate the Significance Purpose and application of Networking Protocols and Standards.

COs.4 Describe compare and contrast LAN WAN MAN Intranet Internet AM FM PM and Various Switching Techniques.

PGDCA-202-(B) Big Data Analysis

COs.1 Ability to identify the chances of datasets and compare the trivial data and big data for various applications

COs.2 Demonstrate an ability to use Hadoop framework to efficiently store retrieve and process Big Data for Analytics

COs.3 Implement several Data Intensive tasks are the Magi reduce Paradigm

PGDCA-203-Database Management System

COs.1 Understand and describe the basic concepts and terminology of Data Management System Analyze and Design the database of applications using ER modelling and Normalization.

COs.2 Evaluate business information problem and find out the data requirements of organization.

COs.3 Demonstrate the database schema, data modelling and normalization process with the help of example Implement the database designing appropriate database tools

Programme- MCA

Programme Outcomes

MCA programme is to impart quality education in Computer Science and its applications, so that students are well prepared to face the challenges of the highly competitive computer industry. The course structure ensures overall development of the student, while concentrating on imparting technical skills required for computer/IT profession.

Programme Specific Outcomes (PSOs):

The programme is designed to

PSO1: enable the students to apply the computing and soft skills acquired in the MCA program for designing and developing innovative applications for the betterment of the society.

PSO2 : Identify, formulate, research literature, and solve complex computing problem searching substantiated conclusions using fundamental principles of mathematics, computing sciences, and relevant domain disciplines.

PSO3: provide exposure to techniques that would enable the students to design, implement and evaluate IT solutions.

PSO4 : Demonstrate knowledge and understanding of the computing and management principles and apply these to one"s own work, as a member and leader in a team to manage projects and in multidisciplinary environments.

PSO5 : Understand and commit to professional ethics and cyber regulations, responsibilities, and norms of professional computing practices.

PSO6 : Understand and assess societal, environmental, health, safety, legal, and cultural issues within local and global contexts, and the consequential responsibilities relevant to professional computing practices.

PSO7: To enable the students to meet the challenges of research and development in computer science and applications.

Course Outcomes:

Course Code 10601 : Computer Organization

On completion of this course, the student will be able to:

CO1: describe the basic organization of computer hardware.

CO2: represent and manipulate data – number systems, conversion between different number systems, perform binary arithmetic.

CO3: learn Boolean algebra, the language that simplifies communication in the world of computers. CO4: understand formal logic, and to reason/infer interesting outcomes; formally prove validity and soundness of a statement.

CO5: design simple combinational and sequential logic circuits - flip-flops, counters, shift registers, adders, subtractor, multiplexer, de-multiplexer, and Arithmetic/Logic unit.

CO6: design simple programs in assembly language.

Course Code 10602: Mathematical Foundation of Computer Science

On completion of this course, the student will be able to gain fundamental knowledge of:

CO1: mathematical structures (sets, relations and functions), and will be able to model real world situations mathematically.

CO2: principles of proportions & lattices.

CO3: Groups, Graphs and their applications in Computer Science.

CO4: discrete Numeric function and Recurrence relation.

CO5: growth of functions asymptotically.

Course Code 10603 : Operating System

On completion of this course, the student will be able to:

CO1 : describe basic functions of an Operating System.

CO2 : distinguish between different types of Operating Systems so as to use each of them most efficiently in the respective application areas.

CO3 : describe different techniques for managing computer resources like CPU, memory, file and devices.

CO4 : implement simple algorithms for managing computer resources

Course Code 10604 : Data Base Management System

On completion of this course, the student will be able to:

CO1 : understand basic database concepts, including the structure and operation of the relational data model.

CO2: apply logical database design principles, including E-R diagrams, conversion of ER diagrams to relations.

CO3: understand the concepts of integrity constraints, relational algebra, relational domain & tuple calculus, data normalization.

CO4: construct simple and moderately advanced database queries using Structured Query Language(SQL).

CO5: understand the emerging fields in database.

Paper Code-10605 : Problem Solving using C & C++

On completion of this course, the student will be able to:

CO1: learn basic concepts of problem solving using programming language.

CO2 : apply procedure oriented & object-oriented paradigm for problem solving.

CO3: select a suitable programming construct and in-built data structure for the given problem.

CO4: design, develop, document, and debug modular programs.

Paper Code-20601 : Data Structure & Analysis of Algorithms

On completion of this course, the student will be able to:

CO1: identify best suited data structure for the problem at hand.

CO2: identify the programming constructs to optimize the performance of the data structure in different scenarios.

CO3: describe the algorithm design techniques: iteration, divide and conquer, dynamic programming, greedy approach algorithms.

CO4: analyse the strengths and weaknesses of each technique.

CO5: identify and apply technique(s) suitable for simple applications.

CO6: appreciate that certain problems are too hard to admit fast solutions

Paper Code-20602 : Software Engineering Methodologies

On completion of the course, the student is expected to:

CO1: demonstrate an understanding of software engineering layered technology and software process models that provide a basis for the software development lifecycle.

CO2: describe software/system requirements and understand the processes involved in the discovery and documentation of these requirements.

CO3: practice system modeling techniques and object-oriented design for software development. CO4: test software using verification and validation, static analysis, reviews, inspections, and audits. CO5: appreciate software project management that includes project planning, project estimation techniques, risk management, quality management, and configuration management.

CO6: work as an individual and/or in team to develop and deliver quality software.

Paper Code-20603 : Computer Graphics & Visualization

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

CO1 : understand the concept of image formation as realized by human visual System.

CO2 : illustrate the digitization process of images and related algorithms for drawing basic geometric figures in the 2D display devices.

CO3 : describe architecture of basic Input/ Output devices and their underlying working principles along with various primitives for drawing shapes.

CO4 : apply fundamental mathematics in producing spatial 3D-image of an object in an inherently 2D display device.

CO5 : understand the basics of OpenGL API and to manipulate graphics & images

Paper Code-206041 : Artificial Intelligence

On completion of this course, the student will be able to:

CO1: describe various approaches to Artificial Intelligence.

CO2: design intelligent agents.

CO3: describe and apply concepts, methods, and theories of search, heuristics, games, knowledge representation, planning.

CO4: acquire basics knowledge of Natural language processing.

CO5: understand the limitations of Artificial Intelligence techniques.

Paper Code-206042 : Cloud Computing

On completion of this course, the student will be able to:

CO1 : understand the architecture and infrastructure of cloud.

CO2 : learn the resource virtualization technique.

CO3 : build the appropriate file system and database.

CO4 : understand cloud security and challenges.

CO5 : evaluate third party cloud services for a real world problem.

Paper Code-20605 : JAVA Programming & Technologies

On completion of this course, the student will be able to:

CO1 : understand the object-oriented concepts – Classes, Objects, Inheritance, Polymorphism– for problem solving.

CO2 : design, implement, document, test, and debug a Java application consisting of multiple classes. CO3 : handle program exceptions.

CO4 : handle input/output through files.

CO5 : create Java applications with graphical user interface (GUI).

Paper Code-30601 : COMPILER DESIGN

On completion of this course, the student will be able to:

CO1: describe how different phases of a compiler work.

CO2: understand formal languages and automata.

CO3: implement top down and bottom up parsing algorithms.

CO4: use compiler tools like lex for implementing syntax directed translator.

CO5: learn implementation of block structure languages.

Paper Code-30602 : Computer Networking & Internet

On completion of this course, the student will be able to:

CO1 : learn the basics of Computer network Technologies.

CO2 : understand the fundamentals of types of transmission mediums and interfacing standards along with the current edge of the data communication techniques.

CO3 : learn flow control and error control techniques and Computer Network protocols at Conceptual level.

CO4 : learn WAN and TCP/IP.

CO5: learn the architecture & protocols of email and www.

Paper Code-306031 : Cryptography & Network Security

On completion of this course, the student will be able to:

CO1: learn classical encryption techniques and block cipher modes of operation.

CO2: implement a symmetric and asymmetric cryptographic methods

CO3 : learn Message authentication and Hash functions.

CO4: describe the role and implementation of digital signatures.

CO5 : understand IP security, Web security and system security.

Paper Code-306032 : Mobile Computing

On completion of this course, the student will be able to:

CO1 : learn multiple access technology for Wireless Communication .

CO2 : understand the concept of mobile data communication.

CO3 : learn Digital Cellular Systems and Standards.

CO4 : describe Components and working of Wireless LAN.

CO5 : understand Bluetooth technology & WLL architecture.

Paper Code-306033 : Software Quality Assurance

On completion of this course, the student will be able to:

CO1 : understand quality management processes.

CO2 : understand the importance of standards in the quality management process and role of SQA function in an organization.

CO3 : gain knowledge of software quality assurance.

CO4: understand the need and purpose of software testing.

CO5: learn the five views of software quality.

Paper Code-306034 : Internet Of Things

On completion of this course, the student will be able to:

CO1 : Understand the IOT Terminology and Technology.

CO2 : Describe IOT applications.

CO3 : Analyze Protocol standardization for IOT.

CO4 : Perform an analysis of IOT security issues.

CO5: Identify the role of cloud computing in IOT

Paper Code-306041 : DOT NET Technology

On completion of this course, the student will be able to:

CO1 : learn .NET Technology.

CO2 : understand the Visual Basic fundamentals.

CO3 : describe the classes, interfaces & arrays.

CO4 : learn creation of window forms & controls.

CO5 : understand file handling and graphics in VB.

Paper Code-306042 : Python Programming

On completion of this course, the student will be able to:

CO1 : understand different data types used in python.

CO2 : get better understanding of different types of control structures.

CO3 : use different data structures for different problem domains.

CO4 : apply different object oriented features for solving real world problems.

CO5 : develop different web based applications.

Paper Code-306043 : Data Warehousing and Mining

On completion of this course, the student will be able to:

CO1 : learn the data mining functionalities.

CO2 : understand and exhibit the basics of data warehousing and multi-dimensional modeling.

CO3 : describe data preprocessing.

CO4 : understand classification , clustering, frequent pattern analysis and regression .

CO5 : learn cluster analysis and DM tools.

Paper Code-306044 : Bigdata Analytics & Visualization

On completion of this course, the student will be able to:

CO1 : learn Big data and its characteristics.

CO2 : understand best practices for Big data Analytics and Integration tools.

CO3 : describe data modeling.

CO4 : learn elementary data analysis.

CO5 : understand basics of visualization.

Paper Code-30605 : Web Applications Development

On completion of this course, the student will be able to:

CO1 : understand web architecture.

CO2 : learn HTML & CSS.

CO3 : apply different modern technologies used for real-time client server application.

CO4 : develop different attractive and interactive web pages.

CO5 : learn basics of android application deployment environment.

AWADHESH PRATAP SINGH UNIVERSITY, REWA(M.P.)

DEPARTMENT OF PSYCHOLOGY

PROGRAMME: B.S.W.

Course Outcomes

101 (Major Core) Foundations of Social Work-

COs.1. Able to understand social work as a profession.

COs.2. Able to understand various ideologies of social work.

COs.3. Able to demonstrate awareness of values and ethics of the social work profession.

102 (Minor Core) Psychology and Social Work-

COs.1. Able to understand psychological concepts and its relevance to Social Work.

COs.2. Able to understand determinants and processes of personality development.

COs.3. Able to understand the basic concepts and processes in social psychology and its relevance to Social Work.

COs.4. Able to understand social attitudes and social cognition.

COs.5. Able to understand psycho-social behaviour.

103 (Generic Elective (GE)* Introduction to Contemporary-

COs.1. Able to understand Indian Society.

COs.2. Able to understand Various Social Groups and Institution.

COs.3. Able to demonstrate Awareness of Social System and Elements of Society.

104 (Ability Enhancement Course) (AEC) Hindi Language-

COs.1. कोर्स अधिगम उपलब्धि (लर्निंग आउटकम) उत्कृष्ट साहित्यिक पाठों के अध्ययन से रूचि का विकास करना।

COs.2. हिन्दी भाषा का व्यवहारिक ज्ञान। भाषा–ज्ञान।

COs.3. सामान्य शब्दावली और विशेष शब्दावली के अध्ययन द्वारा भाषा एवं संस्कृति बोध का विकास करना।

COs.4. विशिष्ट शब्दावली (बीज शब्द/की वर्ड) से परिचित करवाते हुए बोध के स्तर को विकसित करना। प्रतियोगी परीक्षाओं हेतु तैयार करना।

COs.5. अभिव्यक्ति क्षमता का विकास

201 (Major Core) Social Case Work-

COs.1. Able to demonstrate familiarity with Casework processes, tools and techniques and their application in Professional Social Work Practice.

COs.2. Able to develop skills of Observation, Listening, Interviewing and Home Visits, Rapport Building, Resource Mobilization and Recording.

202 (Minor Core) Social Science Concepts and Social Work-

COs.1. Able to understand the basic sociological concepts and notions of society.

COs.2. Able to know the basic concept of economics and structure of economy.

COs.3. Able to explore the knowledge about political framework in the context of social welfare.

203 (Generic Elective (GE)* Community Psychology-

COs.1. Understanding the role of Psychology in community development.

COs.2. Developing an appreciation of the core values that guide Community Psychology and facilitate community functions.

COs.3. Developing insights with respect to health promotion programs in communities, community programme for child and maternal health, for physically challenged and elderly people in the Indian context through case studies.

204 (Ability Enhancement Course) (AEC) Environmental Studies-

COs.1. Understanding the role of Psychology in community development.

COs.2. Developing the critical thinking for shaping strategies.

COs.3. Will be able to analyse the various underlying causes, evaluate the practices and policies, and develop framework to make inform decisions.

Mapping

B.S.W.

Correlation Level

Level	Ranks
High (Substantially)	3
Medium (Moderately)	2
Low (Slightly)	1

Course Code	Course Outcomes	POs.1	POs.2	POs.3	POs.4	POs.5	POs.6
101	COs.1.	3	2	3			
	COs.2.	3	2	2			
	COs.3.	2	3	2			
102	COs.1	3	3	3	2	3	
	COs.2	2	2	2	3	3	
	COs.3	3	1	1	3	2	
	COs.4	1	2	3	2	2	
	COs.5	3	2	3	3	3	
103	COs.1	2	3	1			
	COs.2	2	2	1			
	COs.3	3	3	2			
104	COs.1	2	3	3	3	3	
	COs.2	2	2	3	3	1	
	COs.3	3	3	3	1	3	
	COs.4	2	2	3	2	1	
	COs.5	1	1	3	1	3	
201	COs.1.	2	3				
	COs.2.	3	3				
202	COs.1	2	3	1			
	COs.2	3	2	3			
	COs.3	3	2	2			
203	COs.1	2	3	1			
	COs.2	1	1	2			
	COs.3	3	2	3			
204	COs.1	3	3	2			
	COs.2	3	3	2			
	COs.3	2	2	2			

PROGRAMME: B.A. (HON'S) PSYCHOLOGY

Course Outcomes

101 (Major Core) Introduction to Psychology.

COs.1. To develop knowledge and skill in life through learning principles.

COs.2. Learn to apply techniques of memory improvement in everyday life.

COs.3. Learn to gain self-regulation for quality of life. Acquisition of life skills through motivation.

102 (Minor Core) Psychology and Social Work.

COs.1. Able to understand psychological concepts and its relevance to Social Work.

COs.2. Able to understand determinants and processes of personality development.

COs.3. Able to understand the basic concepts and processes in social psychology and its relevance to Social Work.

COs.4. Able to understand social attitudes and social cognition.

COs.5. Able to understand psycho-social behaviour.

103 (Generic Elective (GE)* Youth, Gender and Identity.

COs.1. Understanding the transitory phase of youth, the issue surrounding it and thereby developing sensitivity to the youth of today.

COs.2. Developing an appreciation of the multiple influences that mould the identity of today's youth.

104 (Ability Enhancement Course) (AEC) Hindi Language

COs.1. कोर्स अधिगम उपलब्धि (लर्निंग आउटकम) उत्कृष्ट साहित्यिक पाठों के अध्ययन से रूचि का विकास करना। हिन्दी भाषा का व्यवहारिक ज्ञान। भाषा–ज्ञान।

COs.2. सामान्य शब्दावली और विशेष शब्दावली के अध्ययन द्वारा भाषा एवं संस्कृति बोध का विकास करना।

COs.3. विशिष्ट शब्दावली (बीज शब्द / की वर्ड) से परिचित करवाते हुए बोध के स्तर को विकसित करना।

COs.4. प्रतियोगी परीक्षाओं हेतु तैयार करना। अभिव्यक्ति क्षमता का विकास।

201 (Major Core) Introduction to Personality

COs.1. Understanding biological and environmental influences on personality development. Students will learn to implement coping strategies for better adjustment.

COs.2. Acquisition of life skills based on happiness and positive thinking.

202 (Minor Core) Contemporary Social Problems and Concern.

COs.1. Able to understand social problems and its relevance to Social Work.

COs.2. Able to understand factor causing social problems.

COs.3. Able to understand the basic concepts and processes of assessing problems related to society.

COs.4. Able to understand genesis and manifestation of social problems.

203 (Generic Elective (GE)* Community Psychology

COs.1. Understanding the role of Psychology in community development.

COs.2. Developing an appreciation of the core values that guide Community Psychology and facilitate community functions.

COs.3. Developing insights with respect to health promotion programs in communities, community programme for child and maternal health, for physically challenged and elderly people in the Indian context through case studies.

204 (Ability Enhancement Course) (AEC) Environmental Studies.

COs.1. Understanding the role of Psychology in community development

COs.2. Developing the critical thinking for shaping strategies.

COs.3. Will able to analyze the various underlying causes, evaluate the practices and policies and develop framework to make inform decisions.

IX Environmental Studies, X Social Psychology, XI Psychological Assessment,

XII Indian Society – Issues and Problems:

COs.1. Emotional connection to the natural world is an important predictor of well-being and ecological behavior.

COs.2. It will help people to develop bonds with nature; environmental psychologists promote sustainable behavior and overall well-being.

COs.3. It will enable the students to critically *assess* information related to the study of behavior and *mental* processes, and use the critical *assessment* in forming conclusions and arguments.

COs.4. To develop basic understanding regarding Indian Society.

COs.5. To understand and develop insight regarding issues and problems related to India Society.

COs.6. Able to understand Indian Society.

COs.7. Able to understand Various Social Groups and Institution.

COs.8. Able to demonstrate Awareness of Social System and Elements of Society.

XIII Introduction to Computers, MS-Office and Internet, XIV Counselling Psychology,

XV Organisational Behaviour, XVI Subsidiary (Sociology) Rural and Urban Sociology.

COs.1. Counselling will help students get to know themselves better and find effective solutions to their daily problems.

COs.2. It will help to analyse and compare different models used to explain individual behaviour and to identify the processes used in developing communication and resolving stress.

XVII Clinical Psychology, XVIII Personality Psychology, XIX Community Psychology, XX Project and Viva Voce.

COs.1. Students will be equipped to serve with the profession of clinical psychology for developing the functional knowledge, skills, attitude and behaviours necessary to combined research, clinical experience and client factors to offer effective care.

COs.2. Students will be able to articulate the major concepts and principles of each personality theory discussed in the class and in the text. Understanding the role of Psychology in community development.

COs.3. Developing an appreciation of the core values that guide Community Psychology and facilitate community functions.

COs.4. Developing insights with respect to health promotion programs in communities, community programme for child and maternal health, for physically challenged and elderly people in the Indian context through case studies.

XXI Educational Psychology, XXII Applied Psychology, XXIII Psychological Research Methods, XXIV Practical and Viva Voce.

COs.1. It will enable students how to learn and process information and look ways to improve performance.

COs.2. It will enhance the ability to interpret and apply research findings for psychological literacy for analysis of data. Students will be able to conduct their own research in future.

COs.3. It will help to apply descriptive and inferential statistics including hypothesis testing for both experimental and non-experimental techniques applicable to psychology.

Mapping

B.A. (Hon's) Psychology

Correlation Level

Level	Ranks
High (Substantially)	3
Medium (Moderately)	2
Low (Slightly)	1

Course Code	Course Outcomes	POs.1	POs.2	POs.3	POs.4	POs.5	
101	COs.1.	3	3	3			
	COs.2.	3	1	2			
	COs.3.	1	3	2			
102	COs.1	3	3	3	2	3	
	COs.2	3	3	2	3	3	
	COs.3	3	1	1	3	2	
	COs.4	3	2	3	2	2	
	COs.5	3	3	3	3	3	
103	COs.1.	3	3	1			
	COs.2.	2	2	1			
104	COs.1	3	3	3	3		
	COs.2	1	2	3	3		
	COs.3	3	3	3	1		
	COs.4	1	2	3	2		
201	COs.1.	2	3				
	COs.2.	3	3				
202	COs.1	1	3	1			
	COs.2	3	2	3			
	COs.3	3	2	2			
	COs.4	3	2	3			
203	COs.1.	2	3	1			
	COs.2.	1	1	2			
	COs.3.	3	2	3			
204	COs.1.	2	3	2			
	COs.2.	3	3	2			
	COs.3.	2	2	2			

PROGRAMME: M.A. PSYCHOLOGY

Course Outcomes

101 Cognitive Processes- I.

COs.1. It will give better understanding of different cognitive processes, memory, attention, language, reasoning etc. which are the part of intellectual processes.

102 Psychopathology.

COs.2. It will enhance personal and social interactions by using the knowledge of history and major models of psychopathological behavior.

COs.3. It will provide understanding to various approaches to the diagnosis and treatment of mental disorders.

103 Research Methods –I.

COs.1. It will enhance the ability to interpret and apply research findings for psychological literacy for analysis of data.

104 Psychological Assessment.

COs.2. It will enable the students to critically *assess* information related to the study of behavior and *mental* processes, and use the critical *assessment* in forming conclusions and arguments.

201 Cognitive Processes- II.

COs.3. It provides knowledge of how human *cognition* works from attention, sensation, perception, action, language processes, problem solving and thinking to learning and memory.

COs.4. The student has knowledge of the key methods used in modern *cognitive psychology* research.

202 Theories of Personality.

COs.1. Students will be able to articulate the major concepts and principles of each personality theory discussed in the class and in the text.

203 Research Methods-II.

COs.2. Students will be able to conduct their own research in future.

COs.3. It will help to apply descriptive and inferential statistics including hypothesis testing for both experimental and non-experimental techniques applicable to psychology.

204 Guidance and Counselling.

COs.1. Guidance and counselling will help students get to know themselves better and find effective solutions to their daily problems.

301 Educational Psychology

COs.2. It will enable students how to learn and process information and look ways to improve performance.

302 Clinical Psychology.

COs.3. Students will be equipped to serve with the profession of clinical psychology for developing the functional knowledge, skills, attitude and behaviors necessary to combined research, clinical experience and client factors to offer effective care.

303 Developmental Psychology

COs.4. It will help in identifying the major issues, tasks and milestones of human development, such as physical, cognitive, social and emotional development throughout the lifespan and to evaluate core concepts, strengths, and weaknesses of the major theories of lifespan development.

304 Health Psychology

COs.5. Students will be able to develop an understanding and appreciation of the complex interplay between one's physical well-being and a variety of biological, psychological, and social factors.

401 Environmental Psychology

COs.6. Emotional connection to the natural world is an important predictor of well-being and ecological behavior.

COs.7. It will help people to develop bonds with nature environmental psychologists promote sustainable behavior and overall well-being.

402 Organizational Behavior

COs.1. It will help to analyze and compare different models used to explain individual behavior and to identify the processes used in developing communication and resolving stress.

403 Psychology of Adjustment.

COs.2. The students will get insight into the events and *psychological* changes that occur and a personal acceptance of these changes; an appropriate *adjustment* of the perception of self; a modification of beliefs and personal goals; and the acquisition of appropriate strategies to adjust.

404 Human Resource Management

COs.3. It will contribute to the development, implementation, and evaluation of employee recruitment, selection, and retention plans and processes and administer and contribute to the design and evaluation of the performance management program.

PROGRAMME: MSW

Course Outcomes

101: History and Philosophy of Social WorkCourse.

COs.1 The end of this course, students will be able to describe theconcepts, history and philosophy of social work and evaluate critically various approaches to social work.

102: Human Growth and Development

COs.1 To acquire knowledge about personality growth and development and gain knowledge about span of human development.

103: Social Case WorkCourse:

COs.1 To understand individuals and their uniqueness.

C O s . 2 Understand Social Case Work as a method of Social Work Practice.3-

COs.3 To understand the process involved in working with individual.

COs.4 To develop the self-awareness and skills in working with individual.

104 Social Science Concepts for Social Workers:

COs.1 To impart knowledge and understanding on basic social science concepts requiredfor Social Work professionals.

COs.2 To develop reasonable knowledge and favorable attitude in respect of our Society &Social System.

COs.3 To enable the learners to understand the concepts of Liberalism and Neo-Libralism.

201 Social Group Work:

COs.1 Appreciate the importance of groups in the life of an individual.

COs.2 Gain knowledge about group formation and the use of variety of group formation andgroup approaches.

COs.3 Develop understanding of concepts dynamics and small group theory in relation to alltypes of groups.

COs.4 Develop knowledge skills and techniques to be used by social worker in groups.

COs.5 Begain and develop commitment to the value of democratic process in group life.

202 Community Organization:

COs.1. Understand the concept and perspectives of community in social work practice;

COs.2. Develop a critical understanding of power relation and power structure in community; Develop understanding of community organization as a method of social work;

COs.3. Develop key skills and capacities in student about Community level social workintervention; Articulate functions and roles of community organizer.

203 Labour Legislations and Social Security:

COs.1. To Understood labour in legal setting;

COs.2. To learn various labour laws in India.

COs.3. To understand the concept of social security.

204 Counselling and Communication:

COs.1. Understand the concept and goals of by studying this course, the learners shall counselling and communication as a helping process.

COs.2. Develop attitudes and inculcate values that enhance investment of self in the counselor's role; and learn to apply counseling and communication skills while working with clients in various settings.

301 Social Work Research:

COs.1. Understand the concept of research in social work and develop ability of statistical analysis.

302 Dynamics of Development:

COs.1. This paper aims to acquaint students with the concept, parameters and issues of multidimensional social development.

COs.2. Students will learn some theories and models of development.

COs.3. This paper also focuses on the emerging concepts of sustainable human developmentas well as and gender and development. Students shall also learn to perceive development with human rights perspective.

303 Youth Development & Empowerment:

COs.1. To understand the state of youth in contemporary Indian Society.

COs.2. To develop basic understanding regarding youth development and Empowerment.

COs.3. To understand and develop insight regarding issues and problems related to youth inIndia.

COs.4. To know the policy, programmes and services for youth welfare & development in India.

304 Tribal Community Development:

COs.1. To develop knowledge and understanding about tribal societies and their situation invarious regions of India.

COs.2. To enable the student to understand the varies problems of tribal people. i.e. social,educational, infrastructural, health & women.

COs.3. To enhance skills on critical review of tribal development Programmes and its Application of social work methods.

COs.4. Review the developmental programmes and their impact on the situation of tribal population.

401 Social Welfare Administration:

COs.1. To orient the students regarding different dimensions of Social Welfare Administration.

COs.2. To acquaint the learners with the basics of social welfare administration.

COs.3. To develop a critical understanding among the learners about the various issues in therealm of social welfare administration, Developmental organizations and Project management.

COs.4. Acquire knowledge about the basic principles and processes of administration.

COs.5. Understanding of social welfare administration in order to get an insight about service delivery system and fundamental concepts of Project and Developmental organizations.

402 Social Policy and Planning Course:

COs.1. Understanding about the social policy and planning in the formulation, evaluation and role of social work profession in the level of governance.

403 Women and Empowerment:

COs.2. Develop basic understanding of the concept of women welfare and empowerment.

COs.3. Understand constitutional and legal safeguards available to women.

COs.4. Gain an overview of the agencies where women form the major client group: Familiarize with the concept of women empowerment and gain insight into the legislative provisions, policies, programmes and role of social work in empowering women.

404 Psychiatric Social Work:

COs.1. To trace the historical development of psychiatric social work in India and abroad

COs.2. To learn to apply the methods of social work in psychiatric setting;

COs.3. To acquire knowledge and skill in rehabilitation of mental patients.

DEPARTMENT OF PSYCHOLOGY

AWADHESH PRATAP SINGH UNIVERSITY, REWA (M.P.)

Programme: MBA (IR&PM)

Programme Outcomes

COs.1 A course each on Training & Development and Knowledge Management & Business Ethics has been placed for better understanding of Human Resource Management.

COs.2 A course on Computer Application has been offered for skill development. Behaviour Lab is a unique feature of the programme which has been introduced to orient the students with ways of solving practical problems related to human behaviour in an organization.

COs.3 Industrial Relations, Industrial Laws and Strategic Management have been included better understanding of the Industrial Environment and to Integrate Knowledge.

COs.4 Discipline Centric Elective Courses on Applied Management, Employee Counseling, HRM in Global Environment and Safety & Service Management to facilitate choice based learning of the students.

Programme Specific Outcomes:

The human resource is considered to be an important competitive factor in any organized activity. The function of managing the personnel has become highly professional in the context of intricacies of new technology and widening markets. The main objectives of MBA (IR & PM) Programme are:

COs.1 To provide knowledge of basic concepts and techniques essential to understandthe basics of Personnel Management.

COs.2 To develop basic skills required by the managers for maintaining good IndustrialRelations and Personnel Functions of a professional organisation.

COs.3 To create abilities to take and execute practical decisions related to labour management.

COs.4 To instill the Human Relations approach in managing the activities of anorganisation.

Course Outcomes

CC 1.1 : Principles and Practices of Management

COs.1 The students will be able to get domain knowledge of the subject to build a strong foundation.

CC 1.2 : Organizational Behaviour & Industrial Psychology

COs.1 The student will be able to motivate themselves & to increase theirability to perform well.

CC 1.3 : Research Methodology & Statistical Techniques

COs.1 This course will acquaint the participants with the basic of research before they go to the corporate world for their project study thiswill also cultivate critical thinking,

analytical skills and problem solving skills in the participants.

CC 1.4 : Business Communication

COs.1 The participants of this course will be able to learn about the various aspects of verbal and non-verbal communication which will be extremely useful to them at the entry level in any professional organisation in the initial years of their career.

CC 1.5 : Personnel Management

COs.1 The students will be able to examine current issues, trends ,practices and processes in personnel management.

GE 1.6 : * Labour Welfare and Quality of Work Life

COs.1 The students will be able to explore the welfare measures provided by the government and the companies.

CC 2.1 : Human Resource Management & Total Quality Management

COs.1 Students able to develop their skills & their usage to management.

CC 2.2 : Computer Application

COs.1 Students able to understand the computer usage in the business organisation & how to analyse data and work on computer.

CC 2.3 : Industrial Law – I

COs.1 The graduates will be acquainted with appropriate ways to analyse and determine wage and salary, settlement of dispute and benefits that employees receive in the organisation.

CC 2.4 : Managerial Economics and Business Environment

COs.1 The graduates of this course will be able to learn about the role of economics in business management and learn about the macro factor affecting business environment and will be well acquainted with the latest changes in the different components of business environment.

CC 2.5 : Management of trade Union

COs.1 The students will be able to understand Trade union and its importance in business.

GE 2.6 : * Labour Costing & Compensation Management

COs.1 The students will be able to understand various techniques available to measure labour productivity and able to motivate labour towardsorganisational goals.

CC 2.7 : Behavioural Lab Project & Viva-voce

COs.1 It enhance the knowledge and improve the understanding of theemployees behaviour in the business.

CC 3.1 : Business Legislation

COs.1 This course will prepare the participants for imaginative and responsible leadership roles in the business. They are expected to critically analyse, evaluate, create solutions in the business and increase understanding of the legal environment in the businesssector.

CC 3.2 : Training and Development

COs.1 To trained employees that helps to do their job well.

CC 3.3 : Knowledge Management & Business Ethics

COs.1 The students will be able to understand that knowledge management and business ethics are key ingredients in an organisation's ability.

DCE 3.4 A : ** Applied Management

COs.1 The students will be able to understand different fields of management like Marketing Finance, MIS & Production.

DCE 3.4 B : ** Employee Counseling

COs.1 Students able to understand self control and how to work effectively in the industries.

GE 3.5 : * Labour Management

COs.1 To improve productivity and minimise rate of absenteeism in the industry.

CC 3.6 : Summer Internship Dissertation & Viva Voce

COs.1 It enhance the knowledge and improve the understanding of theemployees behaviour in the business.

CC 4.1 : Industrial Relations

COs.1 Students would be aware of present state of industrial relationsissues related to collective bargaining, worker's participation, dispute resolution in the organisation.

CC 4.2 : Strategic Management

COs.1 The students will be able to understand the crucially important roleof strategic management in the success of any organisation.

CC 4.3 : Industrial Law – II

COs.1 The Students will develop critical thinking and have ability to understand broadly industrial law which affecting the administration of an organisation.

DCE 4.4 A : ** Human Resource Management in International Global Environment

COs.1 The students will be able to understand how different countries are dealing with HRM

DCE 4.4 B : ** Safety and Service Management

COs.1 Students able to understand various legislative requirements for(safety and service) which are applied in Indian organizations.

GE 4.5 : * Management of Organisational Change & Development

COs.1 Students able to understand field of innovation and how changeworks effectively.

DEPARTMENT OF PHYSICS

AWADHESH PRATAP SINGH UNIVERSITY, REWA(M.P.)

M.Sc. (Physics)

Programme Outcomes

PO1: Development of Analytical, logical and problem solving skills making use of different Mathematical/Computational tools and Observational skills.

PO2: Provide extensive and intensive knowledge of front line new Technologies/Sciences like Nuclear Technology, Space Technology, Communication Technology, LASER Technology, Nano Technology and Remote sensing Technology alongwith their applications.

PO3: Acquire experimental skills and Observational skills through Laboratory practice.

PO4: Ability to build up Electronic circuits and create Programming skills through laboratory practice.

Po5: Achieving knowledge of certain inter disciplinary subjects correlated to Physics with other associated disciplines.

Program Specific Outcomes

PSO1: Provide knowledge of fundamental Physics to aspiring students.PSO2: Enhance

employability/Entrepreneurship/skill developments

PSO3: To develop skill/ability to perform laboratory experiments/Projectworks leading to perform research and Entrepreneurial activities.

PSO4: Develop skills of presentation in form of posters and oral presentationsin seminars and symposia.

Course outcome:

Core Paper C-1 : CLASSICAL MECHANICS

Co1: This course will enable students to understand the concepts of classical theory with references to Newtonian mechanics.

Co2: Ability achieved to apply canonical transformation and Hamilton Jacobi problems.

Co3: It shall developed the ability to use different classical mechanics concepts related to astronomical and scattering applications.

Co4: In depth knowledge in pseudo forces and coriolis forces etc and their existence due to rotation of earth and related phenomena observed on earth would be understood by students.

Core Paper C-2 :QUANTUM MECHANICS-I

CO1: Create ability to develop one and three dimensional harmonic oscillator differential equations by power series method in understanding hydrogen spectrum.

CO2: Ability to derive angular momentum operators and spherical harmonics with polar diagrams.

CO3: Ability to derive the time independent and time dependent perturbation equations andapply to explain different phenomenon.

CO4: Ability to apply approximation methods to understand various phenomenon,estimate ground state energy, etc.

Core Paper C-3 : ELECTRONIC DEVICES

CO1: Detailed information regarding various electronic devices and their applications shall enable students develop Electronic circuits for electronic applications.

CO2: Develop ability to understand different photonic and Microwave devices forphotonic and microwave applications.

CO3: Shall provide concepts of memory devices and electro- optics devices and their Applications and thus enable students to understand electronic devices and omputer system.

Generic Elective Paper GE-1 : MATHEMATICAL PHYSICS

CO1: Shall provide detailed information about various mathematical functions andthus shall develop ability to understand various basic concepts of Physics.

CO2: Ability developed to solve integral and inverse Fourier and Laplace transforms.CO3: Develop ability to analysis complex functions and multivalued functions.

CO4: Shall provide concepts of Tonsorial quantities.

Core Paper C-4 : QUANTUM MECHANICS-II

CO1: Ability to apply Born approximation to different scattering problems, i.e., square wellpotential and Yukawa Potentials, etc.

CO2: Ability to use variational techniques to solve quantum mechanical problems.

CO3: Ability to understand scattering by Born approximation, Partial Wave analysis and solveproblems.

Core Paper C-5 : STATISTICAL MECHANICS

CO1: Understanding the concepts of various ensembles in classical and quantum

statistics andapplicability

CO2: Understanding the concepts of various ensembles in classical and quantum statistics andapplicability.

C03: Supper fluid nature of liquid helium and understanding of various phenomena.

Core Paper C-6 : ELECTRODYNAMICS & PLASMA PHYSICS

CO1: Electrodynamics and plasma physics belong to basic research disciplines that have many different areas of applications; students will be well acquainted with fundamental and applied aspects

CO2: A student shall be equipped with strong foundations of electrodynamics and plasma physics which will help to understand theories of communication electronics, dielectrics,radio wave propagation and various properties of plasma

ATOMIC AND MOLECULAR PHYSICS

CO1: To understand the basic mechanism taking place inside the atom and molecule.

CO2: To understand the spectrum of Hydrogen like atoms, molecular structure and Spectroscopy.

CO3: To distribute electrons in elements and to analyze/interpret rotational and vibrational spectra.

CO4: Shall provide concepts of spectroscopy and their applications.

NUCLEAR AND PARTICLE PHYSICS

CO1: Understand the basic nuclear properties and phenomena.CO2: Understand the nuclear transformations.

CO3: Understand the nuclear reactions mechanism.

CO4: Understand about the elementary particles and their quantum number.

CO5: Understand accelerator technology applied to high energy physics.

CONDENSED MATTER PHYSICS

CO1: Knowledge and understanding of solid state materials for their basic properties andpossible technological applications.

CO2: Shall enhance the knowledge of students regarding thermal properties and elasticproperties.

CO3: The use of fundamental properties and other well developed mechanisms /theories of solid state materials for their better applications in various technological fields.

Digital electronic

This course shall will the capability the students to words the Hardware design and Software application of computer system.

CO2. Shall give the concepts of logic gates and various combinational logic circuits.

CO3. Ability to understand various sequential logic circuits including register and countercircuits among students.

CO4. It will give an idea of interfacing circuits of basic micro processing circuits.

ENERGY PHYSICS

Co1: Provide knowledge of alternate sources of energy among students and enable theircapability in building energy systems using such sources.

Co2: Shall give concepts of biomass and geothermal energy source.

Co3: This course shall make aware the students about solar energy and its applicationin developments of photo voltaic system.

Co4: Give knowledge about hydro energy and harvesting.

SPACE TECHNOLOGY

CO1: Students will understand the basic laws of Physics governing the satellites in itsorbits with their Applications.

CO2: How the power is generated in space? Powers storage devices an spaced requirements will be very interesting for them. Students will also learn the ground and space based observation techniques.

CO3: Students will understand about the space technology and its application in Earths andspace environments.

REMOTE SENSING AND APPLICATIONS

CO1: Students will have thorough idea about the various types of camera and Sensors usedin remote sensing.

CO2: They will also be able to understand the defects and its solutions in the spaceorne images.

CO3: Students will be able to interpret the remote sensing images for different aspects.

INFORMATICS

COs.1 Basic knowledge of various information systems and concepts ofinformation transfer through remote methods will be provided.

COs.2 It will provide information about computer anatomy.

COs.3 Students shall learn concepts of O.S. and network technology

LASER PHYSICS

COs.1 Students shall understand through this course shall learn about concepts oflasers and its application in development of lasing system.

COs.2 Students shall learn about basic concepts of non-linear optics for lasertechnology.

MODERN EXPERIMENTAL TECHNIQUES

COs.1 Capability of students in experiments as tools for research activities shall be developed.

COs.2 Various types of analylitical techniques would be learned in the students like, nuclear techniques, Condensed matter techniques and spectroscopic techniques.

ADVANCED ELECTRONICS

COs.1 Students shall gain knowledge about linear integrated circuits with emphasis to operational capabilities and their applications.

COs.2 Micro processors concepts would be build among students.

COs.3 Detailed H/W knowledge of 8086 ups and assembly language programming shall lead students to design dedicated / general purpose circuits

ASTROPHYSICS

COs.1 To develop ideas about the evolution of with special emphasis on the sun & variousassociated phenomena.

COs.2 To develop basic concepts of astronomical observations & idea about Galaxies, Universe& associated process.

ENVIRONMENTAL PHYSICS

COs.1 To create awareness about the solar & terrestrial radiation & associated environmentalchange

COs.2 To develop the concepts of weather & climate in relation to near earth & space weatherconcept.

PHYSICS OF NANO MATEIALS

COs.1 A student will have clear basic concepts of nano-structured materials.

COs.2 It is expected to train the students for synthesis of various nano-materials and variouscharacterization methods.

COs.3 Students shall appreciate the importance of nano-materials in various technological application like medical technology in treatment of various diseases.

ATMOSPHERIC SCIENCE

COs.1 Students will be able to explain principle, characteristics and applications of differenttypes of Cyclones and anticyclones and thunderstorms.

COs.2 Students will be able to explain the instrumentation of Atmospheric Dynamics, waves and applications

COs.3 Students will be able to explain different types of Atmospheric Radar and Lidar and Atmospheric Aerosols with their applications

DEPARTMENT OF MATHEMATICAL SCIENCES

AWADHESH PRATAP SINGH UNIVERSITY, REWA(M.P.)

M.A./M.Sc. (Mathematics)

Programme Outcomes

POs.1 To develop deep understanding of the fundamental axioms in Mathematics andcapability of developing ideas based on them.

POs.2 To encourage students for research studies in Mathematics and related fields.

POs.3 To enable the students being life-long learner who are able to independentlyexpand their mathematical expertise when needed.

Programme Specific Outcomes:

PSOs.1 To provide advanced knowledge of topics in pure Mathematics.

PSOs.2 To make students understand the techniques of proofs in Mathematics and motivating the students to use mathematical techniques as a tool in the study of other scientific domains.

PSOs.3 To inculcate problem solving skills, thinking and creativity through presentations, assignments and project work.

PSOs.4 To help students in their preparation (personal counseling, books) for competitive exams e.g. NET, JRF, SET, GATE, NBHM etc.

Course Outcomes

MAT-C101 Advanced Abstract Algebra – I

COs.1 Prove Schreier's theorem and Jordan-Holder theorem and also to prove fundamentaltheorem of arithmetic using Jordan-Holder theorem.

COs.2 Characterize perfect fields using separable extensions, construct examples of automorphism group of a field and Galois extensions as well as prove Artin's theorem and the fundamental theorem of Galois theory.

COs.3 Classify finite fields using roots of unity and Galois theory and prove that every finite separable extension is simple.

COs.4 Use Galois theory of equations to prove that a polynomial equation over a field of characteristic is solvable by radicals iff its group (Galois) is a solvable group and hence deduce that a general quintic equation is not solvable by radicals.

MAT-C102 Real Analysis

COs.1 Describe the Riemann-Stieltjes integral and its properties and The fundamental theoremof calculus.

COs.2 Demonstrate an understanding of the theory of sequence and series of

functions, Pointwise and uniform convergence, Power series.

COs.3 Describe functions of several variables, Inverse function theorem and implicit functiontheorem.

COs.4 Demonstrate skills in communication mathematics.

MAT-C103: Topology-I

COs.1 Distinguish countable and uncountable sets.

COs.2 Check whether a collection of subsets is a basis for a given topological space or not anddetermine the topology generated by a given basis.

COs.3 Understand how the topology on a space is determined by the collection of open sets, the collection of closed sets or by a basis of neighbourhoods at each point and to know what it means for function to be continuous.

COs.4 Know the definition and basic properties of connected spaces, Path connectedness.

MAT-C104 Complex Analysis

COs.1 understand analytic function as a mapping on the plane, Mobius transformation andbranch of logarithm.

COs.2 understand Cauchy's theorems and integral formulas on open subsets of the plane.

COs.3 understand how to count the number of zeros of analytic function giving rise to openmapping theorem and Goursat theorem as a converse of Cauchy's theorem.

COs.4 know about the kind of singularities of meromorphic functions which helps in residuetheory and contour integrations.

COs.5 handle integration of meromorphic function with zeros and poles leading to theargument principle and Rouche's theorem.

COs.6 know different versions of the maximum principle as well as the Schwarz's lemma representing analytic function on a disk as fractional mappings.

MAT-GE105 Tensor Analysis

COs.1 Understand coordinate systems and their transformation laws, concepts of tensors andtheir types, Quotient law.

COs.2 Differ between tensor quantities and scalar or vector quantities.

COs.3 Understand Contraction and transvection of tensors, Metric tensor and its associatedtensor, Christoffel symbols and their coordinate transformation laws.

COs.4 Handle Covariant derivatives, Gradient, Divergence and Curl, Intrinsic derivative, Levi-Civita concept of parallelism, Curvature tensor.

MAT-GE106 Linear Programming Problems

COs.1 Formulate some real life problems into Linear programming problem.

COs.2 Use the simplex method to find an optimal vector for the standard linear programmingproblem and the corresponding dual problem.

COs.3 Prove the optimality condition for feasible vectors for Linear programming problem andDual Linear programming problem.

COs.4 find optimal solution of transportation problem and assignment problem

MAT-GE107 Computational Mathematics

COs.1 Handle binary number system, computer arithmetic number base conversion.

COs.2 Understand the errors, source of error and its effect on any numerical computationsand also analysis the efficiency of any numerical algorithms.

COs.3 Learn how to obtain numerical solution of nonlinear equations using bisection, secant,Newton and fixed-point iterations methods and convergence analysis of these methods.

COs.4 Solve linear and nonlinear systems of equations numerically.

COs.5 Understand Extrapolation methods, Numerical Differentiation, Numerical Integration:Newton Cote's integration, Solution of ODE's.

MAT-C201: Advanced Abstract Algebra-II

COs.1 Identify and construct example of modules, and apply homomorphism theorems onthe same.

COs.2 Distinguish between projective, injective, free, and semi simple modules.

COs.3 Prove universal property of tensor product of modules, Hilbert basis theorem.

COs.4 Define and characterize Notherian, Artinian module, and apply the structure theorem offinitely generated modules over PID.

MAT-C202 Lebesgue Measure and Integration

COs.1 Understand signed measures and complex measures, ability to use Hahn decomposition, Jordan decomposition, Radon–Nikodym theorem and recognize singularity of measures.

COs.2 Verify conditions under which a measure defined on a semi-algebra or algebra is extendable to a sigma-algebra and to get the extended measure, and to prove the uniqueness up to multiplication by a scalar of Lebesgue measure in P^nas a translation invariant Borel measure.

COs.3 Learn and apply Riesz representation theorem for a bounded linear functional on L^p -spaces, understand product measure and the results of Fubini and Tonelli.

COs.4 to understand the concepts of Baire sets, Baire measures, regularity of measures on locally compact spaces, Riesz–Markov representation theorem related to the representation of a bounded linear functional on the space of continuous functions.

MAT-C203: Topology-II

COs.1 Know about separation axioms- T_0, T_1, T_2, T_3, T_4 -spaces their characterization andbasic properties.

COs.2 Find one point compactification of spaces like real line and n-sphere.

COs.3 Know interesting results on complete regularity and Stone–Cech compactification.

COs.4 Have studied celebrated results like Urysohn lemma, Tietze extension theorem.

COs.5 Know about useful Urysohn metrization theorem and Nagata Smirnov metrization theorem.

COs.6 Know characterizations of paracompactness in regular spaces and partition of unity.

MAT-C204: Differential Geometry

COs.1 Understand parametric representation of a curve and a surface, Binomial and torsion.

COs.2 Derive Locus of centre of curvature, Osculating sphere, Locus of centre of spherical curvature, Involutes and Evolutes of a curve.

COs.3 Obtain explicit form, Gaussian and Monge's forms, Different types of Surfaces.

COs.4 Get derivatives of unit normal to a surface, Normal and Oblique sections of a surface andtheir curvatures.

COs.5 Get new ideas and techniques which play a prominent role in current research in globaldifferential geometry.

MAT-GE205 Number Theory

COs.1 Understand the properties of divisibility and prime numbers, compute the greatestcommon divisor and least common multiples and handle linear Diophantine equations.

COs.2 Understand the operations with congruences, linear and non-linear congruence equations

COs.3 Understand and use the theorems: Chinese Remainder Theorem, Lagrange theorem,Fermat's theorem, Wilson's theorem.

COs.4 Use arithmetic functions in areas of mathematics.

MAT-GE206: Wavelet Analysis

COs.1 Understand the basics of this course.

COs.2 To think and develop new ideas in this field.

COs.3 To understand the use of this course in science and technology and other fields ofMathematical Analysis.

MAT-GE207: Quantitative Techniques

COs.1 Understand need of Statistics, Characteristics and Limitations of Statistics.

COs.2 Data Collection, Data Classification and Data Gathering, Drafting Questionnaires, SampleSelection, Data Presentation, Measures of central tendency .

COs.3 Do measures of dispersion, Relation between Standard Deviation and other Measures.

COs.4 Know Measure of Skewness, Methods of Least Square, Curve Fitting, Introduction toSampling Techniques and Need for Sampling.

MAT-C301: Functional Analysis-I

COs.1 Verify the requirements of a norm, completeness with respect to a norm, relation between compactness and dimension of a space, check boundedness of a linear operator and relate to continuity, convergence of operators by using a suitable norm, compute the dual spaces.

COs.2 Understand quotient space of normed linear space and its completeness.

COs.3 Prove Riesz lemma and compactness.

COs.4 understand bounded linear functionals and dual spaces of normed linear spaces

MAT-C302 Advanced Special Functions-I

COs.1 Work on Gamma and Beta Functions, Difference equation $\Gamma(z+1) = z\,\Gamma(z)$.

COs.2 Derive value of $\Gamma(z)\,\Gamma(1-z)$, Factorial function, Legendre's duplication formula, Gaussmultiplication theorem.

COs.3 Understand Hypergeometric and Generalized hypergeometric functions, Contiguousfunction relations.

COs.4 Handle Hyperhgeometrical differential equation and its solutions, Elementary seriesmanipulations, Bessel Function and Legendre polynomials, Generating function.

MAT-C303 Riemannian Geometry-I

COs.1 Understand the basic of this course and think & develop new ideas in this course.

COs.2 Know Differentiable manifolds, Tangent spaces, Vector fields, Affine connections,Covariant derivatives, Curvature tensor, Exterior derivative.

COs.3 Understand Riemannian manifolds, Riemannian connection, Sectional curvature, Schur's theorem, Geodesics in Riemannian manifolds, Projective curvature tensor, Conformal curvaturetensor.

COs.4 Cover a wide area of research in differential geometry & Riemannian Geometry.

MAT-DCE304 Integral Transforms-I

COs.1 Explain transformation of elementary functions and properties

COs.2 Illustrate the concepts of transforms of derivatives and integrals develop application todifferential equations.

COs.3 Understand Laplace's Wave Equations, One dimensional Heat conduction equations.

COs.4 handle two dimensional Heat Conduction Equations and its Applications

MAT-DCE305 Differential Geometry of Manifolds-I

PSOs.1 Demonstrate an intuitive and computational understanding of Definition and examples of differentiable manifolds, Tangent spaces, Jacobian map, one parameter group of transformations, Exterior algebra.

PSOs.2 Understand Lie-derivatives, Immersions and Embeddings, Distributions.

PSOs.3 Know Topological groups, Lie groups and Lie algebras, one parameter subgroup andExponential maps.

PSOs.4 Lie transformation groups, General linear groups, Principle fibre bundle, linear framebundle.

PSOs.5 Cover a wide area of research in differential geometry and its applications in physicalsciences and Cosmology.

MAT-DCE306 General Theory of Relativity and Cosmology-I

COs.1 Understand tensors, Algebra of tensors, Symmetric and skew symmetric tensors,Contraction of tensors and Quotient law.

COs.2 Work on Riemannian metric, Levi-Civita tensor, Christoffel symbols, Transformation law ofChristoffel symbols, covariant derivatives, Gradient, Divergent and Curl.

COs.3 Geodesics, Riemann Christoffel curvature tensor and its symmetry properties, identities,Ricci tensor, Einstein tensor

COs.4 Understand and work with General theory of Relativity, Principle of

equivalence and general covariance, Search for Einstein's field equations, and Gravitational field in empty space.

MAT-GE307 Operations Research-I

COs.1 Understand scope, origin and development of Operations Research, characteristics ofOperations Research, use and limitations of Operations Research.

COs.2 Formulate some real life problems into Linear programming problem.

COs.3 use the simple method to find an optimal vector for the standard linear programming

COs.4 problem and the corresponding dual problem

COs.5 Prove the optimality condition for feasible vectors for Linear programming problemand Dual Linear programming problem.

MAT-GE308 Advanced Discrete Mathematics-I

COs.1 Construct mathematical arguments using logical connectives and quantifiers. **CO2:** validate the correctness of an argument using statement and predicate calculus.

COs.2 Understand how lattices and Boolean algebra are used as tools and mathematical models

COs.3 In the study of networks.

COs.4 Learn how to work with some of the discrete structures which include sets, relations, functions, graphs and recurrence relation.

MAT-GE309 Bio-Mathematics

COs.1 Have an enhanced knowledge and understanding of mathematical modeling and statistical methods in the analysis of biological systems.

COs.2 Have sound knowledge of developing mathematical models in the areas of Bio sciences and bio fluid dynamics and their analysis.

COs.3 Develop skills in algebraic manipulation, the calculus of linear and non-linear differential equations.

MAT-C401 Functional Analysis-II

COs.1 Understand inner product spaces, orthogonality and Hillbert spaces.

COs.2 Distinguish between finite and infinite dimensional spaces.

COs.3 Apply linear operators in the formulation of differential and integral equations.

MAT-C402 Advanced Special Functions-II

COs.1 Work with Generating function for Legendre polynomials, Rodrigues formula, Bateman's generating function, Hypergeometric forms of $P_n(X)$, Orthogonality.

COs.2 Understand Hermite polynomials, Pure recurrence relations, Differential recurrence relations.

COs.3 Illustrate The Laguerre Polynomials $L_n(X)$, Jacobi Polynomials, Differential Recurrence Relations, Pure Recurrence Relations, Mixed Relations, Appell's functions of two variables, an elementary generating function.

COs.4 Cover a wide area of research in the area of special functions and its applications.

MAT-C403 Riemannian Geometry-II

COs.1 Work with Orthonormal Basis, Ricci's Coefficient of Rotation, Congruences.

COs.2 Know Submanifolds and hypersurfaces of a Riemannian manifold, Tangent space, Tensordifferentiation.

COs.3 Prove Gauss Formulae, Weingarten formulae, Meunier's theorem, Mainardi-Codazziequations, Gauss Characteristic equation, Joachimsthal's theorem, Killing equation.

COs.4 Cover a wide area of research in differential geometry & Riemannian geometry.

MAT-C404 Integral Transforms-II

COs.1 Explain application of Laplace transform to boundary value problems.

COs.2 Illustrate the concepts of electric circuits, the complex Fourier transform, inversionformula, Fourier cosine and sine transform.

COs.3 Understand properties of Fourier transforms, convolution and Parseval's identity.

COs.4 handle inversion, operational and combined properties Fourier transform

MAT-DCE 405 Differential Geometry of Manifolds-II

COs.1 Demonstrate associated fibre bundle, Vector bundle, Induced bundle, Bundlehomomorphisms.

COs.2 Understand Riemannian manifolds, Riemannian connection, Curvature tensors, Sectionalcurvature and to prove Schur's theorem.

COs.3 Know Topological groups, Lie groups and Lie algebras, one parameter subgroup andExponential maps.

COs.4 Geodesics in a Riemannian manifold, Projective curvature tensor, Conformal curvature tensor, Submanifolds and Hypersurfaces, Almost complex manifolds, Nijenhuis tensor,Contravariant and covariant almost analytic vector fields, F-connection.

COs.5 Cover a wide area of research in differential geometry and its applications in physical sciences and Cosmology.

MAT-DCE406 General Theory of Relativity and Cosmology-II

COs.1 Derive Schwarzschild exterior solution and its isotropic form, Singularities inSchwarzschild line element.

COs.2 Understand Bending of light rays in a gravitational field, Radar echo delay.

COs.3 Illustrate Energy-momentum tensor of a perfect fluid, Schwarzschild internal solution,Boundary conditions, Derivation of Einstein-field equation from variational principle.

COs.4 Understand and work on Static cosmological models, Einstein universe, de-Sitter universe, Difference between Einstein and de-Sitter universe, Derivation of Robertson-Walker metric.

MAT-GE407 Operations Research-II

COs.1 find optimal solution of transportation problem and assignment problem

COs.2 Learn the constructions of networks of a project and optimal scheduling using CPM andPERT.

COs.3 Understand Inventory models on economic lot size system with uniform and non uniformdemand.

COs.4 formulate and solution of linear programming model of two person zero sum game

COs.5 solve nonlinear programming problems using Lagrange multiplier and using Kuhn-Tuckerconditions

MAT-GE408 Advanced Discrete Mathematics- II

COs.1 Understand Directed graphs, weighted undirected graphs, Dijkstra's algorithm, Warshall'salgorithm.

COs.2 Work on Finite State Machines and their transition table diagrams, Non-deterministic fineautomata, Finite automata, Moore and Mealy Machines.

COs.3 understand Turing Machine and Partial recursive functions, Grammars and Languages,Polish Notations, The reverse Polish notation

MAT-GE409: Cryptography

COs.1 Understand cryptography and network security concepts and application

COs.2 Apply security principles to system design

COs.3 Identify and investigate network security threat

COs.4 Analyze and design network security protocols **CO5:** Conduct research in network security.

DEPARTMENT OF BUSINESS ADMINISTRATION

AWADHESH PRATAP SINGH UNIVERSITY, REWA (M.P.)

Programme: MBA

Programme Outcomes (POs)

POs.1 A course on Business Legislation is included to acquaint them with laws related to basic business operations.

POs.2 One course on Research Methodologyhas also been placed here so that the participants could have basic knowledge of research before theygo to Corporate World for their Internship during the Summer Break.

POs.3 A **value based course** on IndianEthos & Ethics Management has been introduced to garnish **sustainability of success** in the long term with the learning's from **Indian values.**

POs.4 **Dual specialization** in MBA Programme is offered with an aim to develop multi skilled products and their better employability.

POs.5 offers **Discipline Centric Elective Courses** on **Marketing, Finance & HRM** as elective **areas of specialization** along with Core Course on Operations Research, MIS and Strategic Management to develop critical thinking, analytical skills, effective communication and integrative approach among the students.

POs.6 **Generic Elective Courses** on Organisational Behaviour & Industrial Psychology, International Business Environment, Entrepreneurship and Managing Banks & Financial Institutions have been introduced to inspire the students to understand human behaviour at work, global perspectives of business, encourage them to establish their own business & start-ups and **value addition** to tap the employment

opportunities in Banking & Finance Sector.

POs.7 Case Studies, Class Presentation, Assignment & Co-curricular activities are integral part of the programme to give **practicalexposure** to the participants regarding local, regional, national & global developments in the field of business management.

POs.8 Dissertation and Comprehensive Viva Voce are included in the programme structure to assess students' skills to implement the learned concepts into practice and test their comprehension ability.

Programme Specific Outcomes (PSOs)

Following six programme specific objectives have been identified as per AICTE Model Curriculum andwill be pursued in order to develop desired knowledge, skills, values and attitudes as learning outcomesamong the students attending the MBA Programme:

PSOs.1 **Business Environment and Domain Knowledge (BEDK)**: Economic, legal and social environmentof Indian business. Graduates are able to improve their awareness sand knowledge about functioningof local and global business environment and society. This helps in recognizing the functioning of businesses, identifying potential business opportunities, evolvement of business enterprises and exploring the entrepreneurial opportunities.

PSOs.2 **Critical thinking, Business Analysis, Problem Solving and Innovative Solutions (CBPI)**: Competencies in quantitative and qualitative techniques. Graduates are expected to develop skills on analysing the business data, application of relevant analysis, and problem solving in other functional areas such as marketing, business strategy and human resources.

PSOs.3 **Global Exposure and Cross-Cultural Understanding (GECCU)**: Demonstrate a global outlook with the ability to identify aspects of the global business and Cross Cultural Understanding.

PSOs.4 **Social Responsiveness and Ethics (SRE)**: Developing responsiveness to contextual social issues/ problems and exploring solutions, understanding business ethics and resolving ethical dilemmas. Graduates are expected to identify the contemporary social problems, exploring the opportunities for social entrepreneurship, designing business solutions and demonstrate ethical standards in organizational decision making. Demonstrate awareness of ethical issues and can distinguish ethical and unethical behaviours.

PSOs.5 **Effective Communication (EC)**: Usage of various forms of business communication, supported byeffective use of appropriate technology, logical reasoning, articulation of ideas. Graduates are expectedto develop effective oral and written communication especially in business applications, with the use of appropriate technology (business presentations, digital communication, social network platforms and so on).

PSOs.6 **Leadership and Teamwork (LT)**: Understanding leadership roles at various levels of the organization and leading teams. Graduates are expected to collaborate and lead teams across organizational boundaries and demonstrate leadership qualities, maximize the usage of diverse skills of team members in the related context.

COURSE OUTCOMES

CC 101: MANAGEMENT CONCEPTS & PRACTICES

Business Environment and Domain Knowledge

COs.1 The graduates will be able learn about the basic concepts, principles and process of management.

COs.2 This learning will build a foundation and help them in understanding basic functioning of the organisations not only in corporate but also in other sectors such as government, NGO, Social Organisations etc.

CC 102: QUANTITATIVE METHODS

Critical thinking, Business Analysis, Problem Solving and Innovative Solutions

COs.1 The graduates of this course will be able learn about the basic mathematics and statistics applicable in businessdecisions.

COs.2 This will sharpen their critical thinking, analytical skills and problem solving ability.

CC 103: MANAGERIAL ECONOMICS

Business Environment and Domain Knowledge

COs.1 The graduates of this course will be able learn about the role of economics in business management and prospects ofthe business in a span of time.

CC 104: BUSINESS ENVIRONMENT

Business Environment and Domain Knowledge

COs.2 The participants of this course will be able learn about the macro factor affecting business environment and will bewell acquainted with the latest changes in the different components of business environment.

CC 105 CP: BUSINESS COMMUNICATION

Effective Communication

COs.1 The participants of this course will be able learn about the various aspects of verbal and non-verbal communication which will be extremely useful to them at the entry level in any professional organisation in the initial years of their career.

CC 106: ACCOUNTING FOR MANAGERS

Business Environment and Domain Knowledge

COs.2 This course will acquaint the participants with the basics of accountancy regarding financial transactions of anorganisation.

CC 107: ICT & E-BUSINESS FUNDAMENTALS

Critical Thinking, Business Analysis, Problem Solving and Innovative Solutions

COs.1 This course will hone the skills of participants with basics of computers, ICT, office automation, E-Businessand emerging technologies.

COs.2 It will also improve the critical thinking, analytical ability and problem solving

skills of the participants.

GE 108: ORGANISATIONAL BEHAVIOUR & INDUSTRIAL PSYCHOLOGY

Leadership, Teamwork, Global Exposure and Cross Cultural Understanding

COs.1 The participants of this course will be able to learn about behavioural aspects of different individuals and groups in an organisation. Graduates are expected to collaborate and lead teams across organisational boundaries and demonstrate leadership qualities.

COs.2 The participants will be able to learn about the various aspects of trans-national culture and global leadership.

CC 201: INDIAN ETHOS & BUSINESS ETHICS

Value based learning & Leadership

COs.1 The participants of this course will be able to learn values from Indian mythology and Role Models and use themin sustainable growth of business organisations.

CC 202: RESEARCH METHODOLOGY

Critical thinking, Business Analysis, Problem Solving and Innovative Solutions

COs.1 This course will acquaint the participants with the basics of research before they go to the corporate world for theirproject study.

COs.2 This will also cultivate critical thinking, analytical skills and problem solving skills in the participants.

CC 203: HUMAN RESOURCE MANAGEMENT

Business Environment and Domain Knowledge

COs.1 This course will ensure the basic learning of managing human resource in an organisation and participantswill also gain understanding of influence of external environment forces on HRM.

CC 204: FINANCIAL MANAGEMENT

Business Environment and Domain Knowledge

COs.1 Graduates will improve their knowledge on functioning of local and global business environment and will beacquainted about various aspects related to sources of funds and management of funds in an organisation

CC 205: MARKETING MANAGEMENT

Business Environment and Domain Knowledge

COs.1 The participants of this course will be able to learn about the foundation of marketing in different focal areas and theywill also understand the impact of various factors on marketing activities.

CC 206: PRODUCTION AND OPERATIONS MANAGEMENT

Business Environment and Domain Knowledge

COs.1 This course will expose the participants with various aspects of manufacturing sector.

COs.2 They will be able to improve productivity in operations through layout engineering, quality management, effective and efficient flow, replenishment and control of materials in manufacturing organisations.

CC 207: BUSINESS LEGISLATION

Business Environment, Domain Knowledge, Critical Thinking & Problem Solving

COs.1 The course will acquaint the participants with functioning of legal business environment and concerned potential issues and laws in managing operations of business and thereby they are expected to make judgment calls and take legit decisions in future that a business professional has to make on daily basis.

COs.2 This course will prepare the participants for imaginative and responsible leadership roles in the business.

COs.3 They are expected to critically analyze,evaluate and create solutions in the business.

GE 208: INTERNATIONAL BUSINESS ENVIRONMENT

Global Exposure and Cross Cultural Understanding

COs.1 The participants will be able to learn about the various aspects of global business environment.

COs.2 They will have basicknowledge about different mechanisms and institutions in International Business.

CC 301: OPERATIONS RESEARCH

Critical thinking, Business Analysis, Problem Solving and Innovative Solutions

COs.1 Competency in quantitative techniques will hone the critical thinking, analytical skills and problem solving ability ofthe participants.

COs.2 They are expected to use these techniques to solve the problems under uncertainty and take appropriate decisions in the business world

DCE 302 A: CONSUMER BEHAVIOUR

Business Environment, Domain Knowledge, Social Responsiveness & Ethics

COs.1 This course provides a valuable insight on how consumers make buying decisions and how different factors affect their buying decisions.

COs.2 The graduates are expected to identify the problems and tap the opportunities in the market by formulating smart marketing strategies and filling the gap between consumers' expectations and company's products& services.

COs.3 The participants will gain an understanding of social issues & problems in the society and will be able toexplore solutions to it within ethical boundaries which would further affect consumer judgment and buying decisionpositively.

DCE 302 B: INVESTMENT ANALYSIS & PORTFOLIO MANAGEMENT

Critical Thinking, Business Analysis, Problem Solving and Innovative Solutions

COs.1 The participants will acquire knowledge on techniques and strategies used to manage funds and assets of the organization.

COs.2 This will refine their analytical skills, problem solving and they will be able to plan and execute investment decisions by gauging the risk patterns effectively thereby managing the portfolio of the organization effectively.

DCE 302 C: EMPLOYEE RELATIONS

Business Environment and Domain Knowledge

COs.1 The participants will learn social and political influences of labour relations on business and thereby it will help themto deal with the realities of managing a business in the complex world.

DCE 303A: SALES AND DISTRIBUTION MANAGEMENT

Business Environment and Domain Knowledge

COs.1 This course gives an understanding of sales, distribution & retailing in Indian business.

COs.2 The graduates are expected to develop responsiveness towards challenges of increasing competition in the business world by resorting to improved methods of sales & distribution aimed at reducing cost, increasing profits and fulfilling the customers' expectations.

DCE 303 B: INTERNATIONAL FINANCE

Global Exposure and Cross Cultural Understanding

COs.1 This course demonstrates a global outlook with the ability to identify global businesses and cross cultural understanding.

COs.2 It will increase the knowledge of participants' imperative for long term financial decisions corresponding to global operations.

DCE 303 C: HUMAN RESOURCE DEVELOPMENT

Business Environment and Domain Knowledge & Social Responsiveness and Ethics

COs.1 This course creates an understanding of HR environment in which business operates and how economic, competitiveand legislative factors affect staffing requirements.

COs.2 The course promotes understanding of various human and culturalvariables in local and global organization.

COs.3 This will enable the graduates to adapt methods, techniques and strategiesthat are used to improve the productivity of human capital.

COs.4 They are expected to learn skills of planning, designing and administering various developmental activities aimed at up scaling the performance of the employees.

GE 304: ENTREPRENEURSHIP

Developing Social Responsiveness and Leadership-

COs.1 This course will encourage the youngsters to respond to the requirements of the society and the economy by becoming job providers instead of job seekers.

COs.2 It will give them motivation and confidence to become business leaders.

CC 305: INTERSHIP DISSERTATION & COMPREHENSIVE VIVA VOCE

Critical Thinking, Business Analysis, Problem Solving and Innovative Solutions

COs.1 The graduates are expected to develop skills on analysing the business data, application of relevant analysis and problem solving and reporting in functional area of management such as Marketing, Finance or Human Resource Management.

CC 401: STRATEGIC MANAGEMENT

Domain Knowledge, Global Approach, Social Responsiveness and Ethics

COs.1 The course gives a picture of how companies determine their long term goals and adapt course of action by appropriately allocating the resources.

COs.2 This will develop responsiveness to contextual social issues, problems and exploring solutions, understanding business ethics.

COs.3 The graduates will be able to analyze the business problems in a comprehensive way and strategize business decisions pertaining to problem across the apex level of management.

CP 402: MANAGEMENT INFORMETION SYSTEM

Critical Thinking, Business Analysis, Problem Solving and Effective Communication

COs.1 Understanding the Information systems used at different levels for processing large amount of data will promote problem solving capacity, critical thinking and analytical skills and thereby innovative solutions to the problem of bulk data processing will be generated.

COs.2 The graduates are expected to make the best use of computer technology in handling the information at different levels of management to take decisions.

COs.3 Competency in MIS will help graduatesto ensure better communication and connectivity throughout the organization across all levels of management.

DCE 403 A: INTEGRATED MARKETING COMMUNICATIONS

Business Environment and Domain Knowledge

COs.1 The graduates will be able to learn various advertising and promotional tools and their importance in attracting the customers.

COs.2 This will also hone their creativity, analytical and communication skills which they are expected to display in developing and managing effective product promotion with the use of appropriate media.

DCE 403 B: PROJECT APPRAISAL & FINANCE

Critical Thinking, Business Analysis, Problem Solving and Innovative Solutions

COs.1 The participants will acquire skills for setting goals within a realistic budget and time.

COs.2 They are expected to play a lead role in planning, executing, monitoring and controlling the projects by ensuring their completion in due time and within budget.

DCE 403 C: COMPENSATION & BENEFITS MANAGEMENT

Domain Knowledge, Critical Thinking and Problem Solving

COs.1 This course offers understanding of various external factors affecting the administration of wage and salary.

COs.2 The graduates will be acquainted with appropriate ways to analyze and determine the salary, incentives and benefits that employees receive in the organization. This will improve their critical thinking & problem solving skills.

COs.3 They are expected to design and offer fair and attractive pay packages and benefits to the employees in compliance with relevant legislations and paying capacity of the organization when they find the decisional role in the organisation.

404 A: INTERNATIONAL MARKETING

Business Environment and Domain Knowledge and Global Exposure and Cross Cultural Understanding

COs.1 This course will improve the awareness on various factors affecting the international business environment.

COs.2 The graduates of this course will be able to learn concepts of marketing in a global perspective which will enable them toidentify, explore opportunities in the field.

COs.3 This course demonstrates a global outlook with the ability to identify global businesses and cross cultural understanding.

DCE 404 B: TAXATION

Domain Knowledge, Critical thinking, Business Analysis and Problem Solving

COs.1 This course will improve the awareness of graduates on local and global business environment related to taxation andthe associated factors that affect the tax planning decisions.

COs.2 The graduates will elicit knowledge about tax structuresand tax planning.

COs.3 It also promotes critical thinking, analytical thinking and problem solving.

DCE 404 C: ORGANISATIONAL CHANGES AND DEVELOPMENT

Domain Knowledge and Social Responsiveness

COs.1 Gaining understanding of organizational changes will allow the graduates to learn new skills, explore new opportunities and exercise creativity in ways that ultimately benefit the organization.

COs.2 The graduates will elicit knowledge about different types of change and ways to manage that change in the organization.

COs.3 They are expected todevelop responsiveness towards the change by exploring the opportunities and strategizing decisions in the favor oforganization.

405: MANAGING BANKS & FINANCIAL INSTITUTIONS

Domain Knowledge & Value Addition

COs.1 This course will improve the awareness of graduates on banking system and working of financial institutions.

COs.2 It willbe value addition to their knowledge as this sector is full of employment opportunity for the fresher's.

COs.3 This course will make them industry ready for placement in Banks & Financial Institutions.

DEPARTMENT OF ENGLISH
AWADHESH PRATAP SINGH UNIVERSITY, REWA (M.P.)

PROGRAMME: M.A. ENGLISH

Programme Outcome

POs.1 The growth of English language and literature over the centuries from a totally different state- more in the condition of a dialect in the earliest periods- to what it is in the present century should form the background knowledge of every student of English literature.

POs.2 The objective of this course is to introduce the music and beauty of the English sounds and vocabulary of the earliest period in English literary history to the students to enable them to have a historical perspective of the developments over the centuries. The course also introduces the great masters of the early period such as Chaucer, Spencer Donne, Milton, Marlowe and Shakespeare.

POs.3 Introduction of poetic forms, and different movements evaluation of the impact of Romanticism and Victorianism on the development of English literature, with emphasis on development of literary form and literary modes of expression and an understanding of concepts of gender and women during these periods have been included :

POs.4 The task of inculcating a comparative awareness in the minds of the participants to realize its cultural significance in the globe as well as in states like India is central to the goal of this course. Inculcation of good teste in literature and human values is the aim of this course.

Course Outcome

Course: Poetry

COs.1 The student will have an in depth idea of English poetry and its different genres.

COs.2 This course will work as a foundation for understanding of poetry and its nuances

Course: Drama

COs.1 The Student will have an understanding of the origin of English drama, Its deep psychological and literary value.

COs.2 The student will have a better understanding of life as such.

Course: Fiction

COs.1 The students learn the evolution of novels as a genre and discus its features.

COs.2 Students are asked to discuss early novel narrative techniques characterisation, plot and themes.

Course: Prose

COs.1 The students discuss the effect of essay writing and autobiography.

COs.2 This Paper gives the students an idea of logical flow of thought in literature through the genre of prose.

Course: Poetry

COs.1 The students compare all genres of poetic form and discuss the glory of romantic poetry.

COs.2 They learn modern poetry and they also discuss the themes of modern poetry.

COs.3 It develops the students sense of understanding literature and poetry.

Course: Drama

COs.1 Students get to know non Shakespearen drama and compare Shakespearen style to other styles and methods.

Course: Fiction

COs.1 The outcome of the course is to initiate critical thinking on evaluation of various constructions of identity, such as age, class, religion and strata in society.

Course: Prose

COs.1 The Students will have a better understanding of English prose. She will feel the naturalness of English Prose.

Course: Comprehensive Viva-Voce

COs.1 This course will equip the student to prepare himself / herself to lay the foundation for learning how to address the dicursive and ideational aspects of literary texts.

COs.2 The study of critical theories will help the student in understanding literature and life better.

Critical Theory

COs.1 This course will equip the student to prepare himself / herself to lay the foundation for learning how to address the dicursive and ideational aspects of literary texts.

COs.2 The study of critical theories will help the student in understanding literature and life better.

English Language

COs.1 In this paper students develop an understanding of the concepts, theories, and methodologies used in linguistics.

Indian Writings in English III

COs.1 Students get to know the beauty and depth of modern Indian English literautre.

Commonwealth Literature in English III

COs.2 The student gets the taste of English literature being written in different countries.

American Literature IV

COs.1 The student develops an understanding of American Literature.

Linguistics and stylistics IV

COs.1 On completion of the course, students should be able to achieve fluency and grammatical accuracy.

Critical Theory

COs.1 Students read complex literary texts deeply and critically

English Language

COs.1 The students will learn English language in a scientific and systematic manner

Indian Writings in English III

COs.1 The students will know the essence of Indian writing in English and will also get the taste of Indian Literature in translation

Commonwealth Literature in English III

COs.1 Students read and understand the basics of Commonwealth Literature.

American Literature IV

COs.1 The learners will develop a taste for American prose writings, major essays and will also enjoy typical American Poetry.

COs.2 The learners will be motivated to read American Fiction.

Linguistics and stylistics IV

COs.1 The Students will learn phonetics and phonology with a better understanding of organs of speech, phonemic symbols, classification of vowels and consonants, syllables, stress, etc.

COs.2 They will understand syntactic and semantic changes in grammar.

DEPARTMENT OF PHILOSOPHY
AWADHESH PRATAP SINGH UNIVERSITY, REWA (M.P.)

M. A. PHILOSOPHY

Programme Outcomes

POs.1 This programme with all its credits may help one become a good human being.

POs.2 Philosophy tells the difference between what man does and what he should do. It also helps one to know the goal of life.

POs.3 Most of the times, in life, man gets into dilemma and does not find himself able to get at the right direction and take the right decision. Such situations of life are handled in a better way by the knowledge of different schools of philosophy, Indian and Western.

POs.4 The participants of this programme will be simultaneously prepared for Civil Services and other competitive exams.

POs.5 The moral values learned would be extremely beneficial for their professional success. Some of the participants with bright career can join the noble profession of teaching in higher education. Corporate would in full of stress now-a-days and there is a demand for their stress management, mental health and behavioural integrity.

POs.6 The participants of this programme can choose a career to become life coach to such target groups for their spiritual enlightment.

Course Outcomes

Course - Indian Metaphysics

COs.1 Through this course students will come face to face with philosophical and rich cultural wisdom of our ancient thinkers. We also hope that students horizon of knowledge will be widened considerably.

Course - Western Metaphysics

COs.1 Students will learn the well-connected history of human wisdom from Greek period to the Modern period beginning with Rene Descartes.

Course - Social Philosophy - I

COs.1 A deep and wider knowledge of society, family, state and justice will help to understand the structure and complications of our society and various theories.

Course - Advaita Vedanta

COs.1 It will motivate students to delve into this field of knowledge and take up this subject in the pursuit of their further study.

Course - Comprehensive Viva-voce

COs.1 Students will find themselves prepared for interviews.

Course - Indian Epistemology

COs.1 This study will make students critical and analytical about the topic.

Course - Western Epistemology

COs.1 A student well-versed in this branch can analyze the contents of knowledge in a right perspective. He will learn this branch of knowledge from Greek period to the time of Hume. A perfect study of epistemology of Zeno, Socrates, Plato, Aristotle and three European Rationalists and three European Empiricists, i.e. from Zeno to Hume will make student a good researcher for further higher studies.

Course - Social Philosophy - II

COs.1 This course will help students to understand all kinds of theories that are in the vogue present day society.

Course - Patanjal Yogsutra

COs.1 The students after their study will be able to alleviate and mitigate the sufferings and stresses of the masses at large.

Course - Comprehensive Viva-voce

COs.1 Students will find themselves prepared for interviews.

Course - Philosophy of Religion - I

COs.1 This course will widen and sharpen the critical caliber of the students.

Course - Logic - I

COs.1 This course will help students avoid making ordinary mistakes of reasoning. It also helps students to clearly understand conceptual relations, which in turn enhances their skills of writing and putting forth their thoughts in a systematic manner.

Course - Gandhian Philosophy

COs.1 It will help students know Gandhism in a nutshell an induce them for further study in this field.

Course - Western Ethic

COs.1 Having studied and imbibed all these tenets and moral theories the students may become good moral preceptors and thus shape a moral society.

Course - Indian Ethics

COs.1 This course will help students learn ethical values which will promote a morally good society all around.

Course - Comprehensive Viva-voce

COs.1 Students will find themselves prepared for interviews.

Course - Philosophy of Religion - II

COs.1 It will make students become better human beings. They will, hopefully, be better equipped to establish harmony in different religions of the world.

Course - Logic - II

COs.1 Students will be well equipped to understand various structures of logic through this course.

Course - Contemporary Indian Philosophy

COs.1 This course will help our students to come forward with convincing and appealing interpretations of our glorious philosophical tradition.

Course - Contemporary Western Philosophy

COs.1 This course will make students acquainted with insightful and motivating thoughts of contemporary philosophers and induce them for further study in this field.

Course - Vedanta Darshan

COs.1 Students will develop critical insights about different schools of Vedanta Philosophy.

Course - Comprehensive Viva-voce

COs.1 Students will find themselves prepared for interviews.

DEPARTMENT OF ENVIRONMENTAL BIOLOGY
AWADHESH PRATAP SINGH UNIVERSITY, REWA (M.P.)
M.Sc. (Environmental Biology)

Programme Outcomes

POs.1 M.Sc. Microbiology is a two-year master degree course. Candidates who have undergraduate degree in Botany, Zoology or any other life science can do Master course in Microbiology.

POs.2 This is an advanced course which imparts in depth knowledge of microorganism including virus, bacteria, algae and their role in waste management and fermentation.

POs.3 Obtained exposure to the environmental pollution control technologies.

POs.4 Acquired the knowledge and skills needed for the environmental design and management.

POs.5 Acquired skills in the preparation, planning and implementation of environmental projects.

POs.6 Developed environmental monitoring skills, including conduct of experiments and data analysis.

POs.7 Students who want to make career in the research field, they should go for M.Sc microbiology course. College/institutes offer admission to postgraduate course in Microbiology on the basis of marks in entrance test.

POs.8 These microorganisms have very unique characteristics, i.e some of them are useful while some are harmful. For an example Lactobacillus is a bacteria which is responsible for curd formation.

POs.9 Some virus may cause life-threatening disease such as Covid-19.

POs.10 In this light, the microbiology field offers immense career scope to candidates.

Program Specific Outcomes

PSOs.1 Understand the basic concepts of Environments and its components along with their interactions through study of Ecology, Biodiversity, Environmental Chemistry, and Environmental Microbiology

PSOs.2 Understand the different kinds of Pollutions and their sources through study of Climate and Air Pollution Studies, Hazardous Waste & Environmental Toxicology and Soil Pollution and different laws about pollution

PSOs.3 Analyse and determine pollution using Environmental Analytical Techniques, Biostatistics and Computational Techniques.

PSOs.4 Understand different technologies like biotechnology, water and Wastewater treatment technology to find the solutions and their applications in abatement of Pollution and other environmental problems.

PSOs.5 Use of different tools for the management of Environment, Energy resources, solid wastes, Biodiversity conservation like Remote Sensing & Geographical Information Systems and different methodologies.

PSOs.6 Understand the disaster management and industrial safety.

PSOs.7 Determine the environmental impact due to different developmental projects and find solution to eliminate these impacts.

PSOs.8 Through Dissertation, student can identify a particular environmental problem, review the literature for finding the gaps, develop research methodology, collect data and carry out data analysis and interpretation for finding a suitable solution and acquire the ability to write the research findings in the form of structured thesis and communicate the research results through oral or poster presentations

Course Outcomes

Ecological Principles

COs.1 Understand basic theories and principles of ecology

COs.2 Understand structure and function of ecosystem and various methods for its monitoring

COs.3 Generate and understanding about the theories, structure, measurement and various phenomenon related to population and community ecology

COs.4 Apply the basics of diversity indices in taxonomical research areas

COs.5 Learn current environmental issues based on ecological principles

COs.6 Acquire critical understanding on anthropogenic activities on environment and knowledge of ecology is vital in taking conservation measures.

COs.7 Apply the knowledge of environmental biotechnology for mitigating emerging environmental issues.

Basic Methods in Ecology

COs.1 Describe common methods used for terrestrial ecological inventories and mapping activities

COs.2 Evaluate and compare alternative methods for specific inventory and mapping purpose, and thereby be able to identify/justify the more relevant methods for different aims

COs.3 Independently plan and carry out suitable ecological inventories and mappings of various taxa

COs.4 Apply instructions in standardised monitoring programs and practice different field methods, mainly such applied in terrestrial environments

COs.5 Evaluate the use of indicator species within environmental monitoring programs

COs.6 Independently compile and evaluate the results of ecological inventories and mappings by using basic statistical methods/models

COs.7 Work with basic applications of GIS (geographic information system)

COs.8 Produce, present and discuss inventory and mapping results orally and in writing.

Populations and Biotic Community

COs.1 This course explores the interactions between organisms, the dynamics of populations and the environment.

COs.2 It deals with animal, plant and pathogenic organisms, and the structuring and function of communities and aims to develop both a quantitative and qualitative understanding of interactions between organisms and their consequences.

Earth Environment and Climatology

COs.1 Describe the hydrologic cycle and feedbacks associated with the cycle that may stabilize or amplify climate change.

COs.2 Be able to use climatology and thier understanding of global teleconnection indices (ENSO, NAO) to assist them in weather forecasting.

COs.3 Read, evaluate, and discuss current climate research articles regarding present and future climate change.

COs.4 Interpret results from studies of present climate, as well as a range of climate models and place these results in the context of modern 'global warming'

COs.5 Use a global climate model to explore a question pertinent to climatology – describe what the model does and be able to analyze the output from this model to quantify climate sensitivity to changes in forcing and identify relevant feedback mechanisms.

Programme: M.Sc. (Biotechnology)

Programme Outcomes

POs.1 Master of Science (M.Sc) in Biotechnology is a postgraduate course. It is a two-year programme divided into 4 semesters.

POs.2 Biotechnology is applied science that deals with bioprocesses in engineering, medicine, technology, and other fields.

POs.3 Demonstrate knowledge for in-depth analytical and critical thinking to identify, formulate and solve the issues related to Biotechnology Industry, Pharma industry, Medical or hospital related organizations, Regulatory Agencies, & Academia.

POs.4 Demonstrate skills to use modern analytical tools/ software/ equipments and analyze and solve problems in various courses of biotechnology

POs.5 Develop skills, attitude and values required for self-directed, lifelong learning and professional development

POs.6 In the M. Sc Biotechnology course, students are imparted advanced knowledge of utilising the biological systems of living organisms to create useful products for mankind.

POs.7 This is an advanced course that offers bright career prospects to students.

POs.8 After doing the course, they can work in companies in the field of healthcare or pharma. Those who have an interest in Biology and its applications can opt for M.Sc in Biotechnology.

POs.9 They can even choose to make a career in research after doing Ph.D. in Biotechnology. Admission to the M.Sc in Biotechnology course is provided on the basis of merit or marks in the entrance exams. Different colleges conduct their own exam for providing admission in the Biotechnology courses. Candidates should be graduate in biological science to become eligible for admission in M.Sc in Biotechnology.

Program Specific Outcomes

PSOs.1 An education in cell biology will impart knowledge to the students to understand origins of cells and the generation of cell diversity, as well as the common features of cellular structure and function – how they obtain energy, synthesize new molecules, communicate, proliferate and survive.

PSOs.2 It will also emphasis on the fundamental importance of cell biology in modern science, particularly in relation to cell technologies and health.

PSOs.3 Basic knowledge of structure and functions of major bio-molecules will be taught.

PSOs.4 Understanding of metabolic pathways (catabolism as well as anabolism), their diversity and how these are specifically regulated and interrelated in different cells.

PSOs.5 Students will understand the importance of microbiology which is an integrated part of Biotechnology.

PSOs.6 All the genetic manipulation of genes is carried primarily with the help of micro-organisms, hence, understanding the growth kinetics, their physiology and genetics is needed for better understanding the Molecular biology and genetic engineering.

PSOs.7 Students will become familiar with the tools and techniques of genetic engineering-DNA manipulation enzymes, genome and transcriptome analysis and manipulation tools, gene expression regulation, production and characterization of recombinant proteins

PSOs.8 An education on developmental biology will impart extensive knowledge to the students with basic concepts that occur within all living organisms, and fundamental processes of fertilization of an egg cell and its step-by-step transformation into the fascinating complexity of a whole organism. By studying developmental biology along with physiology students will gain an understanding of the causes, diagnosis and treatment of disease, and how they affect different parts of the body.

PSOs.9 Developmental Biology along with Physiology addresses the key challenge of population health.

PSOs.10 Students will imbibe the importance of plant biotechnology regarding basic as well as advance knowledge about the in vitro culture, maintenance and preservation of plant cells, tissues and organs. The techniques of haploid, triploid and somatic hybrid plant

DEPARTMENT OF BUSINESS ADMINISTRATION

AWADHESH PRATAP SINGH UNIVERSITY
REWA (MP)

Programme: **Bachelor of Business Administration (BBA)**

Programme Outcomes

POs.1 The BBA Programme structure is divided into eight semesters that spreads over four years. The Courses are classified as major core courses, minor core courses, discipline centric electives, generic electives, ability enhancement and skill enhancement.

POs.2 The semesters include **Major Core Courses** on Management Process and Organisation Behaviour, Financial Management, Marketing Management, Human Resource Management, Production Management, Management Information System, Strategic Management and International Business to develop multi-disciplinary foundation and whet the critical thinking, analytical ability and problem solving skills of the participants.

POs.3 This will develop integrative foundation by imparting an understanding of managerial skills in all functional areas, mathematics & statistics applicable in business, human behaviour at work and various aspects of global environment.

POs.4 **Minor Core Courses** on Basics of Economics, Quantitative techniques, Financial Accounting & Tally, Business Laws, Research Methodology and Operation Research have been incorporated to build a holistic approach and strong foundation of the participants by demonstrating knowledge of facts, research related skills and principles in the field of managing operations legally in the business.

POs.5 **Discipline Centric Elective Courses (DCE)** on Finance, HR and Marketing as elective areas of specialisation to ensure better employability by updating their multi-professional skills has also been included. Besides, the programme also embraces courses for **Skill Enhancement (SE)** of the participants like Computers for Management, Communication Skills and Personality Development & Character Building to ameliorate the professional skills of the participants and prepare them to fit suitably into their field of work.

POs.6 The **Ability Enhancement (AE)** courses like English Language and Environmental Studies have been incorporated with the intention to develop the language proficiency through interactions embedded in meaningful contexts and to impart knowledge on natural processes to sustain life has been included.

POs.7 **Generic Elective Courses (GEC)** on Business Environment, Start-ups & Entrepreneurship, Indian Ethos for Effective Management and Digital Marketing to adequately equip them with market and business related skills imperative for creating and sustaining viable business in the fast changing business environment. Case studies, class presentations, assignments & Co-curricular activities are intrinsic part of the programme to give practical exposure to the participants regarding local, regional, national & global developments in the field of business management.

POs.8 The programme structure also includes dissertation and comprehensive viva voice to gauge student's skills to execute the learned concepts into practice and examine their comprehension and conception ability. This curriculum of BBA aims to provide enriched educational experience to the participants by upgrading their stock of knowledge, skills and attitude and equipping them for a bright professional life in a complex and rapid changing business landscape.

Course Outcome:

101: Management Process & Organisational Behaviour

Business Environment and Domain Knowledge

COs.1 This course will enable participants to understand the basic concepts, principles and process of management.

COs.2 They will be acquainted with the functions, responsibilities of managers along with understanding of how people behave under different conditions and why they behave as they do.

COs.3 Participants would be able to integrate the learning in handling managerial jobs at several levels in the organisation and evaluate most optimal solution to the problems by gaining better understanding on the complexities associated with management of group behaviour in the organisation.

102 Basics of Economics

Business Environment and Domain Knowledge

COs.1 This course will acquaint the participants with role of economics in business management. Their understands of concepts of various market structures, demand and supply functions, demand forecasting and different pricing techniques will enable them to take optimum decisions in their business under different market conditions.

103 Business Environment*

Business Environment and Domain Knowledge

COs.1 This course will acquaint the participants with different constituents of environment and their impact on the business operations.

COs.2 The participants will be able to gain an understanding of various micro and macro factors in the environment and how an entity works in a business environment.

104 English Language

COs.1 This course will hone reading, writing and over all communication skills of the participants which is very basic and imperative for almost all kind of management jobs in the organisation.

COs.2 The graduates are expected to understand the process of communicating and interpreting the human experiences through literary representation using historical context and disciplinary methodologies.

201 Financial Management

Business Environment and Domain Knowledge

COs.1 The Graduates will acquire the knowledge on allocation and management of financial resources which will help them to deal with day to day working capital decisions, major capital investment decisions and raising long term finances.

202 Quantitative Techniques

Critical thinking, Business Analysis, Problem Solving and Innovative Solutions

COs.1 The participants will be able to learn basics of mathematics and statistics applicable in business which will help them to translate a problem in the real business into simple mathematical model to allow easier understanding and aid in problem solving.

COs.2 This will also hone the critical thinking, analytical skills and problem solving ability of the graduates.

203 Start-ups & Entrepreneurship*

Developing Social Responsiveness and Leadership-

COs.1 This course will create an understanding related to the tools necessary to create sustainable and viable businesses.

COs.2 The graduates will be able to generate innovative ideas and exploit market opportunities by turning them into a feasible business plan.

COs.3 They are expected to reciprocate to the requirements of the society by creating unique solutions to the market problems.

204 Environmental Studies

COs.1 The course will install an in-depth knowledge on natural process essential to sustain life and govern economy.

COs.2 This will develop the critical thinking and analytical ability among the participants to strategize for environmental protection and conservation of biodiversity.

COs.3 The graduates are expected to develop empathy for different life forms and appreciate the ecological linkages within web of life.

DEPARTMENT OF A.I.H.C. & ARCHAEOLOGY

AWADHESH PRATAP SINGH UNIVERSITY

REWA (MP)

Programme- B.A. (Hon's) A.I.H.C. & Archaeology

101- Introduction of Ancient Indian History, Culture & Archaeology

COs.1 This course will assist students in comprehending other papers on ancient Indian history.

COs.2 They will be able to understand ancient sites and human thoughts in a very meaningful way.

COs.3 It will also assist students in planning their careers, as Indian history is a major component of any competitive exam.

102 - Indian Philosophy-I

COs.1 This course will assist students in comprehending other papers on ancient Indian history.

COs.2 They will be able to understand ancient sites and human thoughts in a very meaningful way.

COs.3 It will also assist students in planning their careers, as Indian history is a major component of any competitive exam

103 - Ancient Indian Human Value

COs.1 Due to its characteristics, Indian culture is superior to other cultures of the world due to its characteristics in which human values are predominant, but for various reasons, such as family disintegration, industrialization, and migration to cities, ancient values are declining.

COs.2 By studying the presented course, students will get acquainted with their cultural heritage. Also, this subject will help the students a lot in preserving Indian culture

104 – English

COs.1 This course will help students evaluate each system in a critical and comparative light.

COs.2 Through this course, students will be exposed to the philosophical and rich cultural knowledge of ancient thinkers, and it is also expected that the scope of knowledge of the students will be wide and deep

201 - Methods of Archaeology

COs.1 After studying this course, students will be familiar with different methods of archaeology.

COs.2 This archaeological method will play an important role in analysing the archaeological remains as well as help the students a lot in making proper conclusions and scientific decisions.

202 - Indian Philosophy-II

COs.1 Through this course, students will study the philosophical principles of ancient Indian thinkers.

COs.2 Along with this, you will get acquainted with the rich cultural knowledge of India. This topic will be very beneficial for competitive exams.

203 - Heritage Management in India

COs.1 By studying this course, students will gain knowledge of the fundamental concepts related to heritage and the challenges of heritage.

COs.2 They will be able to get a detailed understanding of the various sources of cultural heritage, tangible and intangible, and the role of digital technology in heritage management, methods of conservation and preservation.

COs.3 After studying the above subjects, the students themselves will preserve their cultural heritage and will also inspire others.

204 – Environment

COs.1 After studying this course, students will be familiar with all kinds of information related to the environment.

COs.2 Also, this course will help the students develop an awareness of conservation of the environment.

COs.3 Apart from this, this subject will also prove to be very beneficial for students preparing for competitive examinations.

DEPARTMENT OF BUSINESS ECONOMICS

Programme- B.Com. (Hons)

Programme Outcomes

POs.1 Good familiarity with Economics, Accounting, Marketing, Finance and Management

POs.2 National and international business and economic scene

POs.3 Understanding business operations

Course Outcomes

COs.1 Good familiarity with Economics, Accounting, Marketing, Finance and Management

COs.2 National and international business and economic scene

COs.3 Understanding business operations

Director
IQAC (NAAC)
A.P.S. University, Rewa (M.P.)

Registrar
A.P.S. University, Rewa (M.P.)