DEPARTMENT OF COMPUTER SCIENCE

PROGRAMME OUTCOMES AND COURSE OUTCOMES OF UNDER GRADUATE & POST GRADUATE PROGRAMME (2022 ONWARDS)

NAME OF THE PROGRAMME: B.Sc COMPUTER SCIENCE – PROGRAMME OUTCOME	
PO1	To develop problem solving abilities using a computer.
PO2	To build the necessary skill set and analytical abilities for developing computer based solutions for real life problems
PO3	To create awareness about process and product standards
PO4	To train students in professional skills related to Software Industry.
PO5	To prepare necessary knowledge base for research and development in Computer Science
PO6	Develop various real time applications using latest technologies and programming languages.
M.Sc COMPUTER SCIENCE	
PO1	Be technology-oriented with the knowledge and ability to develop creative solutions, and better understand the effects of future developments of computer systems and technology on people and society.
PO2	Gain some development experience within a specific field of Computer Science, through project work.
PO3	Use creativity, critical thinking, analysis and research skill.
PO4	Learn new technology, grasping the concepts and issues behind its use and the use of computers.
PO4	Build up programming, analytical and logical thinking abilities.

NAME OF THE PROGRAMME : B.Sc COMPUTER SCIENCE – COURSE OUTCOMES	
SEMESTER I	
PROGRAMMING IN C	1. The Student will be able to understand the concepts of Constants, Variables, and Data Types, Operators and Expressions. 2. The Student will be able to understand the concepts of Managing Input and Output Operations, Decision Making and Branching, Decision Making and Looping. 3. The Student will be able to understand the concepts of Arrays, 4. Character Arrays and Strings, User Defined Functions. 5. The Student will be able to understand the concepts of Structure and Unions, Pointers, File Management in C. 6. The Student will be able to understand the concepts of Fundamental Algorithms, Factoring Methods

PROGRAMMING IN C - LAB	1. Enhance the analyzing and problem solving skills and use the same for writing programs in C. 2. Write diversified solutions, draw flowcharts and develop a well-documented and indented program according to coding standards. 3. Learn to debug a given program and execute the C program. 4. To have enough practice the use of conditional and looping statements. 5. To implement arrays, functions and pointers.
MATHEMATICS – I	To Explore the Fundamental Concepts of Mathematics
SEMESTER II	
C++ & DATA STRUCTURES	1. The Student will be able to understand the concepts of object oriented programming Apply structure and inline functions. 2. The Student will be able to understand the concepts of th type of inheritances and Applying various levels of Inheritance for real time problems Apply the OOPs concepts class and object. Understand, Explain the file concept and exception handlings in C++ 3. The Student will be able to understand the concepts of Stacks and Queue using array and pointers. 4. The Student will be able to understand the concepts of Recursion, Binary Search Tree and graphs 5. The Student will be able to understand the concepts of Sorting and Searching Algorithms.
C++ & DATA STRUCTURES LAB	1. Understand the Creating and Deleting the Objects with the Concepts of Constructors and Destructors. 2. Demonstrate the Polymorphism Concepts and Operator Overloading. 3. Understand basic Data Structures such as Arrays, Linked Lists, 4. Stacks, Queues, Doubly Linked List and Infix to Postfix Conversion. 5. Apply Algorithm for solving problems like Sorting and Searching. 6. Apply Algorithms and use Graphs and Trees as tools to visualize and simplify Problems
SEMESTER III	
PROGRAMMING IN JAVA	1. Students are able to know about a General-purpose and Purely object-oriented programming language including data types, control statements, and classes 2. Students are able to Secured, well-suited for internet programming using applets and GUI-based
PROGRAMMING IN JAVA LAB	1. Students are able to know to Implementation of Classes and objects 2. Understand the basic I/O Streams 3. Students are able to know to Implementation of Frames, Menus, Dialog
	1. The student will be able to find the acceleration due to gravity at a

ALLIED - 2 PAPER -1 PHYSICS I	place using simple pendulum and compound pendulum. Also can know the properties of matter like elasticity, viscosity and surface tension. 2. The student will be able to derive the expression for the velocity of a sound in a stretched string and hence they can determine the frequency of A.C mains
STATISTICAL METHODS AND THEIR APPLICATIONS	To understand and computing statistical Methods by which to develop the programming Skills.
DIGITAL LOGIC DESIGN AND COMPUTER ORGANIZATION	1. The students with a detailed knowledge on digital logic, internals of the System logic circuits and to know the working principles of the computers. 2. Students are able to know about a General-purpose and Purely object-oriented programming language including data types, control statements, and classes
INTRODUCTION TO INFORMATION TECHNOLOGY	1. Students understand Major components of Computer System and its working principles. 2. Students learn and understand the Role of an Operating System and basic terminologies of networks. 3. Students understand how the Information Technology aids for the Current Scenario. 4. Students understand the Computer Software. 5. Students understand internet applications
SEMESTER-IV	
RELATIONAL DATABASE MANAGEMENT SYSTEMS	1. Describe the database architecture and its applications Sketch the ER diagram for real world applications Uses various ER diagram for a similar concepts from various sources. 2. Discuss about the relational algebra and calculus Construct various queries in SQL and PL/SQL Compiles various queries in SQL, Relational Calculus and Algebra. 3. Describe the various normalization forms Apply the normalization concepts for a table of data Practices a table and implement the normalization concepts. 4. Explain the storage and accessing of data. 5. Illustrate the query processing in database management. Define the concurrency control and deadlock concept

RELATIONAL DATABASE MANAGEMENT SYSTEMS LABS	1. Design and Implement a database schema for a given problem domain. 2. Populate and Query a database using SQL DDL/DML Commands. 3. Build well formed in String Date/Aggregate Functions. 4. Design and Implement a database query using Joins, Sub-Queries and Set Operations. 5. Program in SQL including Objects (Functions, Procedures, Triggers)
ALLIED 2 - PHYSICS	1. The student will be able to study the frames of reference, Galilean transformation equations and special theory of relativity. 2. The student will be able to describe the different atomic models and Stern and Gerlach Experiment. 3. The student will be able to explain binding energy, liquid drop model, G.M counter and particle accelerators. 4. The student will be able to know the conversion of number systems from one to other and also will be able to design universal gates using NAND and NOR gates. 5. The student will be able to understanding the basics of nanomaterial, synthesis and its applications
ALLIED PRACTICAL-PHYSICS	1. The student will be able to explain binding energy, liquid drop model, G.M counter and particle accelerators. 2. The student will be able to describe the different atomic models and Stern and Gerlach Experiment.
STATISTICAL METHODS AND THEIR APPLICATIONS IVI	1. To understand and computing statistical Methods by which to develop the programmingSkills.
SKILL BASED SUBJECT WIRELESS DATA COMMUNICATION	1. To understand the concepts of basic OSI layers. 2. To understand the concepts of signals and transmission media. 3. To understand the basic concepts of error detection and DLC 4. To understand the Characterize of wireless transmission technologies 5. To understand the concepts of Security.

NON-MAJOR ELECTIVE INTERNET TECHNOLOGY	1. Students understand the Fundamentals of Internet, Connectivity and its Resource Requirements. 2. Students understand the Internet Technology and its applications 3. Students Understand the basis of WWW and Web Browsers. 4. Students learn how to Mailing system and applications of Internet. 5. Students Understand relay chat that is how to read e- contents.
SEMESTER -V	
MOBILE APPLICATIONS DEVELOPMENT	1. This course aims to provide the students with a detailed knowledge on Mobile Application Development and Deployment about Android programming from basics to building mobile applications for digital world.
OPERATING SYSTEM	1. Enable the student to get sufficient knowledge on concepts, functions and various system resources of operating systems.
DESIGN AND ANALYSIS OF ALGORITHMS	1. The objective of the course is to teach techniques for effective problem solving in computing. 2. The use of different paradigms of problem solving will be used to illustrate clever and efficient ways to solve a given problem. 3. In each case emphasis will be placed on rigorously proving correctness of the algorithm.
MOBILE APPLICATIONS DEVELOPMENT LAB	1. Develop an application that makes use of RSS Feed. 2. Develop an application that create alarm clock. 3. Implement an application that creates an alert upon receiving a message.
OPERATING SYSTEM LAB	1. Implement an Algorithm for Dead Lock Detection 2. Implement the following CPU scheduling algorithms
INTERNAL ELECTIVE DATA MINING	1. To enable the students to understand the importance of Data Mining and its techniques with recent trends and tools.
INFORMATION SECURITY	1. To enable the student to understand various methodologies available for securing information.
ELEC PAPER-1 SOFTWARE TESTING	1. To study the concepts of software engineering with the aim of acquiring skills to develop Software applications, following all standardized procedures and techniques.
SOFTWARE ENGINEERING	1. This course is intended to provide the students with an overall view over Software Engineering discipline and with insight into the processes of software development.
SEMESTER VI	

OPEN SOURCE SOFTWARE	1. To study the concepts of open source techniques that can be effectively applied in practice about HTML5, JavaScript, PHP, and PERL.
PYTHON PROGRAMMING	1. Describe the basics of the Python programming language. 2. Install Python and write your first program. 3. Use variables to store, retrieve and calculate information. 4. Utilize core programming tools such as functions and loops
PYTHON PROGRAMMING LAB	1. Write, Test and Debug Python Programs 2. Implement Conditionals and Loops for Python Programs 3. Use functions and represent Compound data using Lists, Tuples 4. and Dictionaries 5. Read and write data from & to files in Python and develop 6. Application using Pygame
OPEN SOURCE SOFTWARE LAB	1. Implement various applications using build systems 2. Understand the installation of various packages in open source 3. operating systems 4. Create simple GUI applications using Gambas 3 5. Understand various version control systems 6. Understand the kernel configuration and virtual environment
ELEC PAPER -2 BIG DATA ANALYTICS	1. To explore the fundamental concepts of big data analytics. 2. To learn to analyze the big data using intelligent techniques and 3. mining data stream. 4. To understand the applications using Map Reduce Concepts.
CRYPTOGRAPHY	1. Understand various Security practices and System security 2. standards 3. Understand different cryptographic operations 4. Understand the various Authentication schemes to simulate different applications.
DIGITAL IMAGE PROCESSING	1. This course enables the student knowledge about various image processing concepts like enhancement, restoration, segmentation,compression and recognition.
ELEC PAPER -3 ARTIFICIAL INTELLIGENCE	1. To induce the innovative ideas of students, related to Robotics, Artificial Intelligence and Machine Learning. This course enables the student's level to compete in the world of information and technology era.
SYSTEM SOFTWARE	1. To have an understanding the basic design of assemblers, loaders, 2. linkers, macro processor 3. To understand the basic concepts of system software 4. Ability to trace the path of a source code to object code and to 5. executable file 6. To design and implementation of loaders and linkers 7. To understand the concepts of macro processor 8. Ability to analyze the functions of compilers

CLOUD COMPUTING	1. To enable the students to learn the basic functions, principles and concepts of cloud computing Systems.
INTERNET OF THINGS	1. This course presents the Introduction to IoT, M2M,IoT Architecture, IoT Model And Views, IOT protocols and Real world design constraints enable the students to learn the concepts of IoT

NAME OF THE PROGRAMME: M.Sc COMPUTER SCIENCE - COURSE OUTCOMES	
SEMESTER –I	
RELATIONAL DATABASE MANAGEMENT SYSTEM	1. Students are able to have a broad understanding of database concepts and database management system software 2. Students are able to have a high-level understanding of major DBMS components and their function 3. Students are able to know the various normalization techniques. 4. Students are able to write SQL commands to create tables and indexes, insert/update/delete data, and query data in a relational DBMS. 5. Students are able to understand the PL/SQL and Stored Procedures.
ENTERPRISE JAVA PROGRAMMING	1. Students are able to understand about applets concepts. 2. Students are able to understand java networking system. 3. Students are able to understand about collections and design 4. patterns. 5. Students are able to develop applications using JSP. 6. Students are able to concept of web programming.
PROGRAMMING USING C#.NET	1. Students are able to understand about introduction of C#.NET. 2. Students are able to understand what is mean by windows forms. 3. Students are able to understand about delegates and events. 4. Students are able to understand reflection and remoting. 5. Students are able to understand about database in C#.NET.
RELATIONAL DATABASE MANAGEMENT SYSTEM LAB	1. Students are able to have a broad understanding of database concepts and database management system software. 2. Students are able to have a high-level understanding of major DBMS components and their function 3. Students are able to know the various normalization techniques. 4. Students are able to write SQL commands to create tables and indexes,insert/update/delete data, and query data in a relational DBMS. 5. Students are able to understand the PL/SQL and Stored Procedures.
ENTERPRISE JAVA	1. Students are able to understand about applets concepts.

PROGRAMMING LAB	2. Students are able to understand java networking system. 3. Students are able to understand about collections and design 4. patterns. 5. Students are able to develop applications using JSP. 6. Students are able to concept of web programming.
PROGRAMMING USING C#.NET LAB	1. Students are able to understand about introduction of C#.NET. 2. Students are able to understand what is mean by windows forms. 3. Students are able to understand about delegates and events. 4. Students are able to understand reflection and remoting. 5. Students are able to understand about database in C#.NET.
COMPUTER ORGANIZATION	1. Students are able to understand about Organization and design concepts 2. Students are able to describe the translation model of 3. Assembly language to machine language. 4. Students are able to understand about Micro program Control concepts. 5. Students are able to understand central processor unit. 6. Students are able to understand about pipeline and vector 7. Processing concepts.
PARALLEL COMPUTING	1. Students are able to understand about Scalability and Clustering concepts. 2. Students are able to understand about enabling technologies. 3. Students are able to understand interconnections of systems. 4. Students are able to understand Parallel Programming. 5. Students are able to understand about Message Passing 6. Programming.
EMBEDDED SYSTEM	1. Students are able to understand introduction about Embedded system. 2. Students are able to understand about processors of Embedded system 3. Students are able to understand about memory systems. 4. Students are able to understand about basic peripheral of Embedded system. 5. Students are able to understand about Real-Time Operating system.
E-COMMERCE	1. Students are able to understand fundamentals of E-Commerce. 2. Students are able to understand about E-Procurement. 3. Students are able to understand about Customer relationship management. 4. Students are able to understand about M-Commerce. 5. Students are able to understand about Management of Mobile commerce services.
INTRODUCTION TO COMPUTER	1. Students are able to know about computer. 2. Students are able to operate computer using GUI based

APPLICATIONS	operating system. 3. Students are able to understand about word processing. 4. Students are able to understand about spread sheet. 5. Students are able to understand about making PPT presentation.
PRINCIPLES OF INTERNET	1. Students are able to learn the basics of Internet 2. Students are able to provide fundamental knowledge WWW
SEMESTER II	
ADVANCED ENTERPRISE JAVA PROGRAMMING	1. Students are able to work with JSP, JSF and Servlet using MVC approach. 2. Students are able todevelop the web applications using the MVC framework provided by Apache Struts 3. Students are able todevelop Enterprise web application using EJB. 4. Students are able toimplement the Object-Relation Mapping technique using Hibernate 5. Students are able to gets knowledge of Aspect Oriented 6. Programming using Spring and Spring MVC.
DESIGN AND ANALYSIS OF ALGORITHM	1. Students are able to prove the correctness and analyze the running time of the basic algorithms for those classic problems. 2. Students are able tounderstand the basic knowledge of algorithm design and its implementation. 3. Students are able to learn the key techniques of Divide-and-Conquer and Greedy Method. 4. Students are able torecognize the concept of Dynamic Programming and its algorithms 5.Students are able to familiarize with Backtracking algorithms. 6. Students are able to understand Branch and Bound techniques for designing and analyzing algorithms.
WEB APPLICATION USING C#.NET	1. Students are able to know the differences between desktop application and web application. 2. Students are able to construct classes, methods, and access modifier and instantiate objects. 3. Students are able to create and manipulate GUI components in C# for windows application. 4. Students are able to code solutions and compile C# projects within the .NET framework. 5. Students are able to build the desktop application with Database.
PRACTICAL 4: ADVANCED ENTERPRISES JAVA	1. Know about designing online applications using advanced java concepts. 2. Know about the server side scripting using Java Beans. 3. Understand and implement component model objects using Enterprise Java Beans.

PROGRAMMING	4. Able to implement backend connectivity for dynamic applications. 5. Able to build the complete web solutions to the different applications.
PRACTICAL 5: DESIGN AND ANALYSIS OF ALGORITHM	1. Understanding basic ideas about algorithms. 2. Basic ability to analyze algorithms and to determine algorithm correctness and time efficiency class. 3. Understand different algorithm design techniques through various algorithms like divide and conquer, greedy, etc. Ability to developing efficient algorithms for simple computational problems using a variety of advanced abstract data type (ADT) and data structures and their implementations. 4. Ability to apply and implement learned algorithm design techniques and data structures to solve problems.
PRACTICAL 6: WEB APPLICATION USING C#.NET	1. Know about to designWeb Configuration 2. HTML Control Classes, Control Events, Container and Input Control Classes, 3. Ability to apply and implement Web Control Classes & Control Tags 4. Learn about the Validation Controls
HUMAN COMPUTER INTERACTION	1. Students are able to plan and Develop procedures and life Cycle of Human Computer Interaction 2.Students are able to analyze product usage through appropriate assessments and testing techniques. 3. Students are able to apply the interface structure standards/rules for different users. 4. Students are able to encourage communication between understudies of brain science, structure, and software engineering on UI improvement projects. 5. Students are able to understand the intensity of HCI in the cutting edge world and the job it can play in advancing value, openness, and progress.
SOCIAL INFORMATION N/W	1. Students are able to clear understanding of real world applications 2. Students are able to comprehend the elements of the social network 3. Students are able to demonstrate and envision the social network 4. Students are able to understand the role of web in the social network 5. Students are able to apply the concept of social network in appropriate application
CLOUD COMPUTING	1. Students are able to understand the broad perceptive of cloud architecture and model. 2. Students are able tounderstand the concept of parallel and distributed computing 3. Students are able to understand the different technologies. Students are able tounderstand the features of virtualization. Students are able to learn to design the trusted cloud computing system with different cloud platforms

PRINCIPLES OF WEB DESIGN	1. Students are able to learn how to combine basic HTML elements to create Web pages. 2. Students are able to understand the use of HTML tags and tag attributes to control a Web page's appearance. 3. Students are able to capable to learn how to add absolute URLs, relative URLs, and named anchors to Web pages. Students are able to gain a good understanding of using tables and frames as navigational aids on a Web site. 4. Students are able to control appearance webpages by applying style sheet.
OPEN SOURCE APPLICATIONS	1. Students are able to understand the features of PHP 2. Students are able to develop the different applications using PHP 3. Students are able to demonstrate the applications using PHP with Mysql 4. Students are able to understand the concepts of Perl Students are able to develop the applications using Perl
PROBLEM SOLVING TECHNIQUES	1. Students are able to develop programming techniques required to solve a given problem. 2. Students are able to develop problem solving skill using top – down design principles. 3. Students are able to design an algorithm for a problem. 4. Students are able to develop techniques to handle array structure 5. Students are able to develop techniques such as searching and sorting
SEMESTER III	
DISTRIBUTED OPERATING SYSTEM	1. Students are able to understand foundations of DistributedSystems. 2. Students are able to get the idea of memory management 3. Students are able to comprehend in detail the system level and support required for distributed system. 4. Students are able to recognize the shell script commands of Unix
XML AND WEB SERVICES	1. Students are able to understand the use of web services in B2C and B2B applications. 2. Students are able to understand the design principles and application of SOAP and REST based web services. 3. Students are able to design collaborating web services according to a specification. 4. Students are able to implement an application that uses multiple web services in a realistic business scenario.
PROGRAMMING USING PYTHON	1. Students are able to explore the fundamental concepts of Python 2. Students are able to understand Basics of Python programming language 3. Students are able to solve simple problems using Python 4. Students are able to acquire fundamental knowledge and skills on Python Programming

	5. Students are able to understand the nuances of this language. 6. Students are able to know the usage of modules and packages in Python 7. Students are able to familiarize with file concepts in Python 8. Students are able to familiarize with web concepts using Python.
DISTRIBUTED OPERATING SYSTEM	1. To provide hardware and software issues in modern distributed systems. 2. To get knowledge in distributed architecture, naming, 3. synchronization, consistency and replication, fault tolerance, security, and distributed file systems. 4. To analyze the current popular distributed systems such as peer-to-peer (P2P) systems will also be analyzed. 5. To know about Shared Memory Techniques. 6. Have Sufficient knowledge about file access. 7. Have knowledge of Synchronization and Deadlock
XML AND WEB SERVICES	1. Develop web pages using HTML, DHTML and Cascading Styles sheets 2. Develop web pages using HTML, DHTML and Cascading Styles sheets. 3. Develop a dynamic web pages using JavaScript (client side programming). 4. Develop an interactive web applications using ASP.NET. 5. Build and consume web services. CO6 Develop a Program using XML.
PROGRAMMING USING PYTHON	1. Write, Test and Debug Python Programs 2. Implement Conditionals and Loops for Python Programs 3. Use functions and represent Compound data using Lists, 4. Tuples and Dictionaries 5. Read and write data from & to files in Python and develop Application using Pygame
BLOCKCHAIN TECHNOLOGY	1. Students are able to understand the functions of Blockchains 2. Students are able to have clarity in the Concepts, challenges, solutions with respect to blockchain 3. Students are able to understand the facts and myths related to cryptocurrencies. 4. Students are able to apply the concept of Blockchain for various applications. 5. Students are able to correlate Current Indian scenario governing cryptocurrencies in India with Global standard.
INTERNET OF THINGS	1. Students are able to design and develop IOT based solution for real world applications 2. Students are able to realize the evolution of Internet in Mobile Devices, Cloud & Sensor Networks 3. Students are able to understand the building blocks of Internet of Things and its characteristics.

	4. Students are able to understand the concept of IOT and its application.
NETWORK SECURITY	1. Students are able to identify some of the driving factors needed for network security. 2. Students are able to Identify and classify attacks and threats. 3. Students are able tocompare and contrast symmetric and asymmetric encryption systems. 4. Students are able toidentify the web systems vulnerable to attack. 5. Students are able touse appropriate secure mail applications and security protocols
PROGRAMMING USING C	1. Students are able to understand a functional hierarchical code organization. 2. Students are able to define and manage data structures based on problem subject domain. 3. Students are able to work with textual information, characters and strings. 4. Students are able to work with arrays, structures, pointers and files.
PROGRAMMING USING C++	1. Students are able to understand object oriented programming and advanced C++ concepts. 2. Students are able to understand the various functions and arguments in object oriented programming. 3. Students are able to understand the classes and objects in C++. 4. Students are able to familiarize with inheritance and polymorphisms. 5. Students are able to understand the concepts files and exception handling.
PROGRAMMING USING PYTHON	1. Students are able to explore the fundamental concepts of Python 2. Students are able to understand Basics of Python programming language 3. Students are able to solve simple problems using Python 4. Students are able to acquire fundamental knowledge and skills on Python Programming 5. Students are able to understand the nuances of this language. 6. Students are able to know the usage of modules and packages in Python 7. Students are able to familiarize with file concepts in Python 8. Students are able to familiarize with web concepts using Python.
SEMESTER IV	
MOBILE APPLICATION	1. Students are able to know about the mobile application development environment 2. Students are able to develop interface and design

DEVELOPMENT	3.Students are able to use the techniques in Mobile applications
SOFTWARE PROJECT MANAGEMENT	1. Students are able to understand the activities during the project scheduling of any software application. 2. Students are able to learn the risk management activities and the resource allocation for the projects. 3. Students are able to apply the software estimation and recent quality standards for evaluation of the software Projects. 4. Students are able to acquire knowledge and skills needed for the construction of highly reliable software project. 5. Students are able to able to create reliable, replicable cost estimation that links to the requirements of project planning and managing.
PRACTICAL 1: MOBILE APPLICATION DEVELOPMENT	1. Develop an application that makes use of RSS Feed. 2. Develop an application that create alarm clock. 3. Implement an application that creates an alert upon receiving a message.
BIG DATA ANALYSIS	1. Students are able to learn about types of digital data and big data 2. Students are able to gain knowledge of various Big data analtics and its Technologies 3. Students are able to study about various NoSQL databases and management techniques 4. Students are able to work with NoSQL databases such as MongoDB and Cassendra 5. Students are able to design Big data queries using Hive and Pig.
ARTIFICIAL INTELLIGENCE	1. Students are able to understand the various searching techniques, constraint satisfaction problem and example problems- game playing techniques. 2. Students are able toapply these techniques in applications which involve perception, reasoning and learning. 3. Students are able toexplain the role of agents and how it is related to environment and the way of evaluating it and how agents can act by establishing goals. 4. Students are able toacquire the knowledge of real world Knowledge representation. 5. Students are able toanalyze and design a real world problem for implementation and understand the dynamic behavior of a system. 6. Students are able touse different machine learning techniques to design AI machine and enveloping applications for real world problems
MACHINE LEARNING	1. Students are able to design and implement machine learning solutions to classification, regression, and clustering problems; Students are able to evaluate and interpret the results of the algorithms.

	2. Students are able to select and implement machine learning techniques and computing environment that are suitable for the applications under consideration. **3.** Students are able to solve problems associated with batch learning and online learning, and the big data characteristics such as high dimensionality, dynamically growing data and in particular scalability issues. **4.** Students are able to understand and apply scaling up machine learning techniques and associated computing techniques and technologies. **5.** Students are able to recognize and implement various ways of selecting suitable model parameters for different machine learning techniques.
CYBER SECURITY	1. Students are able to understand the cyber threats and their Impact 2. Students are able to have an awareness towards cybercrimes and legal impact against them 3. Students are able to avoid becoming a Victim to cyber threats 4. Students are able to assess risks and weakness in security policies 5. Students are able to respond to security alerts and identify flaws in systems and networks
DECISION SUPPORT SYSTEM	1. Students are able to recognize the relationship between business information needs and decision making 2. Students are able to appraise the general nature and range of decision support systems 3. Students are able to appraise issues related to the development of DSS 4. Students are able to select appropriate modeling techniques 5. Students are able to analyze, design and implement a DSS
RESEARCH METHODS & ETHICS	1. Students are able to demonstrate knowledge of research processes (reading, evaluating, and developing); 2. Students are able to perform literature reviews using print and online databases; 3. Students are able to identify, explain, compare, and prepare the key elements of a research proposal/report; 4. Students are able to compare and contrast quantitative and qualitative research