

## **PROGRAM SPECIFICATIONS OF THE POST GRADUATE PROGRAMS OFFERED BY THE DEPARTMENT**

**1. Name of the program: Master of Computer Science (M.Sc(CS))**

### **2. Program Specifications**

School of Studies: School of Mathematical and Computational Science

Department: Computer Science and Information Technology (CSIT)

Program: Master of Computer Science

Head of the Department: Dr. Pushplata Pujari

Date of Last Approval in Board of Studies: 24.02.2017

Next revision due: 2021

**3. Mode of Study:** Full time (Semester system):

Class room teaching; experiential learning; Tutorials;

Experimental laboratory training; Project assignments;

Major project work in final semester.

### **Background and purpose of the course:**

The objective is to provide computer education added to core and advance subject of computer science with innovative learning facilities to the learners. This course provides innovative computer knowledge to the learners which enhance the personality and help to develop professionals in the field of Computer Science. This program also develops the knowledge of programming and networking skills to the learners. The learners also have the knowledge of both theoretical and practical aspect of computer.

### **Learning outcome**

- This programme gives the opportunity to work in computer science industry for development of software and software testing.
- It also able to learners for finding various jobs like database administrators, software professionals, system analyst in government as well as in private sectors.
- This programme provides competitive environment for the learners which enable to stand and compete themselves.

**Knowledge gained**

On completion of M.Sc. (CS) post graduation degree, the students will be able to apply the **knowledge** of technical, computational, logical and computing fundamentals to various real life applications as per requirement. This course gives the knowledge of design and development of applications to analyze and solve all computer science related problems.

**Skills:**

- The students are inculcated with the background and experience required to model, analyze, and solve advanced problems in real world (Industrial work).
- The students can combine and use knowledge from several disciplines.
- The students will have the ability to develop and renew scientific competence independently,
- The students will be able to enter new problem areas that require an analytic and innovative approach.
- The students can disseminate subject matter and results to both specialists and a broader audience.

**General competence:**

- Students are able to understand the role of computer in society and has the background to consider ethical problems.
- Students are able to gather, assess, and make use of new information.
- Students are able to successfully carry out advanced tasks and projects, both independently and in collaboration with others and also across disciplines.
- Students have an adequate background for pursuing pedagogic education.
- Students have an international perspective on her/his discipline.

## Master of Science (Computer Science)

### PROGRAMME SPECIFIC OBJECTIVES:

- The specific objective of the programme is to provide knowledge of programming languages which helps to develop software professional.
- It also achieves the well computer literates' and educated learners who will be able to become a member of the growth of information technology industries.
- It also able to students for finding various jobs like database administrators, software professionals, system analyst in government as well as in private sectors.
- It provides competitive environment for the students which enable to stand and compete themselves.

<b>Course Specific Objectives &amp; Learning Outcomes</b>		
<b>Course Code</b>	<b>Course Name</b>	<b>Objective and Learning Outcomes</b>
M.SC(CS)-101	Introduction to Information Technology	<p><b>COURSE OBJECTIVE:</b> The objective of this course is to provide basic concept of computer and its application. This course is also designed to familiar with a number of utility software, programming languages, basic concept of networking and overview of latest IT trends and technology.</p> <p><b>COURSE OUTCOMES:</b> The student will be</p> <ul style="list-style-type: none"> <li>• Able to apply knowledge of computers and utilities of number of software that is useful for students.</li> <li>• Able to analyze use of programming languages and solution of the problem using programming languages. Able to analyze the application of networking and familiar with latest trends and technology.</li> </ul>
M.SC(CS)-102	Computer Programming and Numerical Methods	<p><b>COURSE OBJECTIVE:</b> The objective of this course is to Develop a greater understanding of the issues involved in programming language design and implementation. Basically this course provides the numerical methods of solving the Algebraic Equations, Simultaneous Algebraic Equation, interpolation, differentiation, and integration.</p>

		<p><b>COURSE OUTCOMES:</b></p> <p>The students will be</p> <ul style="list-style-type: none"> <li>• Able to understand and writing the overview of structured program using C language.</li> <li>• Able to understand and acquire fundamental concept of numerical methods.</li> <li>• Able to analyze mathematical and engineering problems by using numerical methods.</li> </ul>
M.SC(CS)-103	Discrete Mathematical Structures	<p><b>COURSE OBJECTIVES:</b></p> <ul style="list-style-type: none"> <li>• The objective of this course simplify and evaluate basic logic statements including compound statements, implications, inverses, converses, and contra positives using truth tables and the properties of logic. It also express a logic sentence in terms of predicates, quantifiers, and logical connectives and determine the domain and range of a discrete or non-discrete function, graph functions, identify one-to-one functions, perform the composition of functions, and apply the properties of functions to application problems.</li> </ul> <p><b>COURSE OUTCOMES:</b></p> <p>The students will be</p> <ul style="list-style-type: none"> <li>• Able to write an argument using logical notation and determine if the argument is or is not valid.</li> <li>• Able to understand the basic principles of sets and operations in sets.</li> <li>• Able to demonstrate an understanding of relations and functions and be able to determine their properties.</li> <li>• Able to demonstrate an understanding of Graph and application of graph theory.</li> </ul>
M.SC(CS)-104	Data Structure using C	<p><b>COURSE OBJECTIVES:</b> The objective of this course is to understand the basic concepts of data structures and algorithms with C programming. This course describe the concept and application of stack, Queues, Trees and Graphs, It also explores the concepts about searching and sorting techniques.</p> <p><b>COURSE OUTCOMES:</b></p> <p>The students will</p> <ul style="list-style-type: none"> <li>• Be able to analyze algorithms and algorithm correctness.</li> <li>• Have the ability to describe and their application of stack, queue graph and tree operation.</li> <li>• Be able to use of searching and sorting techniques</li> </ul>

		in different fields.
M.SC(CS)-105	Computer Organization	<p><b>COURSE OBJECTIVE:</b></p> <ul style="list-style-type: none"> <li>• The main objective of this course is to study the basic organization and architecture of digital computers (CPU, memory, I/O, software). It includes different digital logic circuits and understanding and utilization of digital computers.</li> </ul> <p><b>COURSE OUTCOMES:</b> The student will</p> <ul style="list-style-type: none"> <li>• Be able to perform computer arithmetic operations using different logic gates.</li> <li>• Have an ability to understand control unit operations.</li> <li>• Able to understand the uses of different combinational and sequential circuits</li> <li>• Able to understand the concept of types of memory.</li> </ul>
M.SC(CS)-106	LAB-I: Data Structure using C	<p><b>COURSE OBJECTIVE:</b> The objective of this course is to understand the basic concepts of data structures and algorithms with C programming. This course implements the concept and application of stack, Queues, Trees and Graphs. It also explores the concepts about searching and sorting techniques.</p> <p><b>COURSE OUTCOMES:</b> The student will</p> <ul style="list-style-type: none"> <li>• Be able to analyze algorithms and algorithm correctness.</li> <li>• Have an ability to describe and their application of stack, queue graph and tree operation.</li> <li>• Be able to use of searching and sorting techniques in different fields.</li> </ul>
M.SC(CS)-107	LAB-II: Computer Hardware and Digital Electronics	<p><b>COURSE OBJECTIVES:</b></p> <ul style="list-style-type: none"> <li>• The main objective of this course is to study and verify the basic Computer Hardware and architecture of digital computer. It provides a clear idea of implementing different digital logic circuits and understanding and utilization of digital computers.</li> </ul> <p><b>COURSE OUTCOMES:</b> The students will</p> <ul style="list-style-type: none"> <li>• Be able to perform computer logic operations using different logic gates.</li> <li>• Have an ability to understand digital logic</li> </ul>

		<p>circuits.</p> <ul style="list-style-type: none"> <li>• Be able to understand the uses of different combinational and sequential circuits</li> </ul>
M.SC(CS)-201	Principles of Operating System	<p><b>COURSE OBJECTIVES:</b> The main objective of this course is to learn the fundamentals of Operating Systems. This course explores the mechanisms of OS to handle processes and threads and their communication and also learn the mechanisms involved in memory management in contemporary OS. It also includes and explores the file and secondary storage management system.</p> <p><b>COURSE OUTCOMES:</b> The student will be</p> <ul style="list-style-type: none"> <li>• Able to analyze the architecture of OS and basic architectural components involved in OS design.</li> <li>• Able to analyze and design the applications to run in parallel either using process or thread models of different OS.</li> <li>• Able to analyze the various device and resource management techniques.</li> <li>• Able to understand the Mutual exclusion, Deadlock detection.</li> <li>• Able to understand the file and secondary storage management system.</li> </ul>
M.SC(CS)-202	Object Oriented Programming with C++	<p><b>COURSE OBJECTIVES:</b> The main objective of this course is to understand the basic concept and application of object oriented programming using C++. It includes understanding the concept and use of function, object and classes and how to learn concept of inheritance and polymorphism. This course also explores input- output, file handling and exception handling to solve the real time problem.</p> <p><b>COURSE OUTCOMES:</b> The students will</p> <ul style="list-style-type: none"> <li>• Be Able to understand the features of C++ supporting object oriented programming.</li> <li>• Have n ability to understand the relative merits of C++ as an object oriented programming language</li> <li>• Be able to understand how to produce object-oriented software using C++</li> <li>• Have an ability to understand how to apply the major object-oriented concepts to implement object oriented programs in C++, encapsulation, inheritance and polymorphism.</li> <li>• Be able to understand advanced features of C++ specifically stream I/O, templates and exception</li> </ul>

		handling.
M.SC(CS)-203	Theory of Computation	<p><b>COURSE OBJECTIVES:</b> The objective of this course is to explore the mathematical foundations of computation including automata theory, the theory of formal languages and grammars,; the notions of algorithm, decidability, complexity, and computability. It also develops student's ability to understand and conduct mathematical proofs for computation and algorithms.</p> <p><b>COURSE OUTCOMES:</b> The students will be</p> <ul style="list-style-type: none"> <li>• Able to understand the key notions of computation, such as algorithm, computability, decidability, reducibility, and complexity, through problem solving.</li> <li>• Able to understand the models of computation, including formal languages, grammars and automata, and their connections.</li> <li>• Able to analyze and design finite automata, pushdown automata, Turing machines, formal languages, and grammars.</li> <li>• Able to understand the concept of Turing machine and its application.</li> </ul>
M.SC(CS)-204 (A)	Computer Networks (Elective I)	<p><b>COURSE OBJECTIVES:</b> The main objective of this course is to build an understanding of the fundamental concepts of computer networking. This course offers to students with the basic taxonomy and terminology of the computer networking area and preparing for entry advanced courses in computer networking.</p> <p><b>COURSE OUTCOMES:</b></p> <ul style="list-style-type: none"> <li>• Enable to understand and explain Data Communications System and its components.</li> <li>• Enable to identify the different types of network topologies and protocols.</li> <li>• Enable to explore the layers of the OSI model and TCP/IP and explain the function(s) of each layer.</li> <li>• Enable to identify the different types of network devices and their functions within a network</li> <li>• Enable to identify the security issues like cryptography, authentication protocol and other related security policy.</li> </ul>

M.SC(CS)- 204(B)	System Analysis and Design (Elective I)	<p><b>COURSE OBJECTIVES:</b> The objective of this course work is to introduce analysts, designers to manage projects, analyze and document systems, design new systems and implement their plans. It introduces also a recent coverage of UML and cost benefit of design.</p> <p><b>COURSE OUTCOMES:</b> The student will be able</p> <ul style="list-style-type: none"> <li>• Able to understand the principles and tools of systems analysis and design.</li> <li>• Able to understand the SDLC of system development in different context.</li> <li>• Able to understand the professional and ethical responsibilities system implementation and software documentation.</li> </ul>
M.SC(CS)- 204(C)	Introduction to Microprocessor (Elective I)	<p><b>COURSE OBJECTIVES:</b> The main objective of this course work is to introduce students with the architecture and operation of fundamental concept of microprocessors. It introduces the programming techniques and also introduces various interface chips and addressing modes.</p> <p><b>COURSE OUTCOMES:</b> The student will be</p> <ul style="list-style-type: none"> <li>• Able to assess and solve basic binary math operations using the microprocessor and also explain the microprocessor's internal architecture and its operation.</li> <li>• Able to apply knowledge and demonstrate programming proficiency using the various addressing modes and data transfer instructions of the target microprocessor. .</li> <li>• Able to evaluate assembly language programs and download the machine code that will provide solutions real-world control problems.</li> </ul>
M.SC(CS)- 205 (A)	Object Oriented Software Engineering (Elective II)	<p><b>COURSE OBJECTIVES:</b> The objectives of this course are to explore the fundamental concept of object oriented programming and analysis. It explores the object modeling notation, structural diagram, Behavioral Diagrams. It also explores the benefit of pattern analysis.</p>



		<p><b>COURSE OUTCOMES:</b> The student will be</p> <ul style="list-style-type: none"> <li>• Able to interact with a client to elicit project requirements by developing and refining scenarios and use cases.</li> <li>• Able to extract an Object Model and Dynamic Model of system functionality and performance from the requirements.</li> <li>• Able design and implement structured, robust, maintainable object-oriented systems across multiple platforms and appropriate programming languages from the specifications developed.</li> </ul>
M.SC(CS)-205 (B)	Multimedia(Elective II)	<p><b>COURSE OBJECTIVES:</b></p> <p>The objective of this course work is to learn and understand technical aspect of Multimedia Systems and understand the standards available for different audio, video and text applications. It also explores the data compression techniques and terminology in optical storage media and retrieval technology.</p> <p><b>COURSE OUTCOMES:</b> The student will be</p> <ul style="list-style-type: none"> <li>• To Develop and understanding of technical aspect of Multimedia Systems.</li> <li>• To Understand various file formats for audio, video and text media.</li> <li>• To Develop various Multimedia Systems applicable in real time.</li> </ul>
M.SC(CS)-205 (C)	Linux operating System and Shell Programming (Elective II)	<p><b>COURSE OBJECTIVES:</b></p> <p>The objective of this course is to understand and make effective use of linux utilities and shell scripting language to solve problems. It also implement in C some standard linux utilities like mv,cp,ls etc. and develop the skills the necessary for systems programming including file system.</p> <p><b>COURSE OUTCOMES:</b> The student will be</p> <ul style="list-style-type: none"> <li>• Able to understand the basic commands of linux operating system and can write shell scripts.</li> <li>• Able to create file systems and directories and operate them.</li> </ul>

		<ul style="list-style-type: none"> <li>• Able to work on file management system with file management commands.</li> </ul>
M.SC(CS)-206	OOP LAB (C++)	<p><b>COURSE OBJECTIVES:</b></p> <ul style="list-style-type: none"> <li>• To learn how to write inline functions for efficiency and performance.</li> <li>• To learn the syntax and semantics of the C++ programming language.</li> <li>• To learn how to design C++ classes for code reuse.</li> <li>• To learn how to implement copy constructors and class member functions.</li> <li>• To understand the concept of data abstraction and encapsulation.</li> <li>• To learn how to overload functions and operators in C++.</li> <li>• To learn how containment and inheritance promote code reuse in C++.</li> <li>• To learn how inheritance and virtual functions implement dynamic binding with polymorphism.</li> <li>• To learn how to design and implement generic classes with C++ templates.</li> </ul> <p><b>COURSE OUTCOMES:</b> Student must be able to</p> <ul style="list-style-type: none"> <li>• Describe the procedural and object oriented paradigm with concepts of streams, classes, functions, data and objects.</li> <li>• Understand dynamic memory management techniques using pointers, constructors, destructors.</li> <li>• Describe the concept of function overloading, operator overloading, virtual functions and polymorphism.</li> <li>• Classify inheritance with the understanding of early and late binding, usage of exception handling, generic programming.</li> <li>• Demonstrate the use of various OOPs concepts with the help of programs.</li> </ul>
M.SC(CS)-207 (A)	LAB based on Object Oriented Software Engineering.	<p><b>COURSE OBJECTIVES:</b></p> <ul style="list-style-type: none"> <li>• To plan a software engineering process life cycle , including the specification, design, implementation, and testing of software systems that meet specification, performance, maintenance and quality requirements</li> <li>• To elicit, analyze and specify software requirements through a productive working relationship with various stakeholders of the project</li> <li>• To analyze and translate a specification into a</li> </ul>

		<p>design, and then realize that design practically, using an appropriate software engineering methodology.</p> <ul style="list-style-type: none"> <li>• To develop the code from the design and effectively apply relevant standards and perform testing, and quality management and practice</li> <li>• To use modern engineering tools necessary for software project management, time management and software reuse.</li> </ul> <p><b>COURSE OUTCMES:</b> Student must be able to</p> <ul style="list-style-type: none"> <li>• Understand basic concepts of Software UML design and implementation</li> <li>• Perform software testing on various applications</li> <li>• Understand and apply various software metrics on software quality products</li> </ul>
M.SC(CS)-207 (B)	LAB based on Multimedia	<p><b>COURSE OBJECTIVES:</b></p> <ul style="list-style-type: none"> <li>• To gain fundamental knowledge regarding technical concepts and practices in information technology (IT).</li> <li>• To identify and evaluate current and emerging technologies and assess their applicability.</li> <li>• To gain a broad background across fundamental areas of information technology along with a depth of understanding in a particular area of interest within the domain of information systems.</li> </ul> <p><b>COURSE OUTCOMES:</b> The student will have</p> <ul style="list-style-type: none"> <li>• An ability to use and apply current technical concepts and practices in the core information technologies.</li> <li>• An understanding of best practices and standards and their application.</li> </ul>
M.SC(CS)-207 ( C)	LAB based on Linux Operating System and Shell Programming	<p><b>COURSE OBJECTIVES:</b></p> <ul style="list-style-type: none"> <li>• To demonstrate the installation process of various operating systems.</li> <li>• To virtualizes by installing Virtual Machine software.</li> <li>• To Apply UNIX/LINUX operating system commands.</li> <li>• To explain different UNIX/LINUX shell scripts and execute various shell programs</li> </ul> <p><b>COURSE OUTCOMES:</b> Student will be able to</p>

		<ul style="list-style-type: none"> <li>• Demonstrate the installation process of various operating systems.</li> <li>• Virtualizes by installing Virtual Machine software.</li> <li>• Apply UNIX/LINUX operating system commands.</li> <li>• Understand different UNIX/LINUX shell scripts and execute various shell programs</li> </ul>
MSC-301	Probability and Statistics	<p><b>COURSE OBJECTIVES:</b> The main objective of this course is to provide students with the foundations of probabilistic and statistical analysis used in varied applications in like science, engineering. Students will learn the fundamental theory of distribution of random variables, the basic theory and techniques of parameter estimation and tests of hypotheses.</p> <p><b>COURSE OUTCOMES:</b> The students will be</p> <ul style="list-style-type: none"> <li>• Able to understand the basic knowledge on fundamental probability concepts, including random variable, probability of an event, additive rules and conditional probability.</li> <li>• Able to understand the basic statistical concepts and measures.</li> <li>• Able to understand several well-known distributions, including Binomial, Negative Binomial, Pascal, Normal and Exponential Distribution.</li> <li>• Able to understand the concepts of various parameter estimation methods like estimation, Maximum Likelihood Estimator, Notation &amp; Interval Estimation. Small Sample Tests, Large Sample Tests.</li> </ul>

MSC-302	Artificial Intelligence	<p><b>COURSE OBJECTIVES:</b> The main objective of this course work is to understanding the basic concept of AI and expert system. This course explores the basic concept of various searching techniques for problem solving approach. It also includes supervised and unsupervised learning for classification and pattern reorganization.</p> <p><b>COURSE OUTCOMES:</b> The students will be</p> <ul style="list-style-type: none"> <li>• Able to analyze and understanding of the fundamental issues and challenges of AI and machine Expert System: like their applications, problem solving methods and complexity.</li> <li>• Able to understanding of the strengths and weaknesses of many popular searching techniques, supervised and unsupervised approaches.</li> </ul>
MSC-303	Relational Data Base Management System	<p><b>COURSE OBJECTIVES:</b> The objective of this course work is to understand and uses of the basic concept of database management system. This course explores how to update database content with SQL and transaction handling.</p> <p><b>COURSE OUTCOMES:</b> The students will be</p> <ul style="list-style-type: none"> <li>• Able to Learn about database models.</li> <li>• Able to Learn how to write simple as well as complex queries for retrieving data from database</li> <li>• Able to learn how to update, insert and delete data.</li> <li>• Able to Learn about functions and procedure and gain understanding on different Views</li> <li>• Able to learn how to work with Triggers and design a database</li> <li>• Able to learn how to ensure integrity related to multiple an related database updates.</li> </ul>
MSC-304(A)	Advanced Java Programming (Elective -III)	<p><b>COURSE OBJECTIVES:</b> The objective of this research work is to explore basic concept of classes and multithreading for developing web based applications. It explore network and database connectivity based programming. It explore the servlets, JSP and remote method invocation for web based programming.</p>

		<p><b>COURSE OUTCOMES:</b> The students will be</p> <ul style="list-style-type: none"> <li>• Able to learn the Internet Programming, using Java Applets.</li> <li>• Able to create multithreading program.</li> <li>• Able to learn client and server side programming with database connectivity.</li> <li>• Able to create servlets and JSP server side programming.</li> <li>• Able to invoke the remote methods in an application using Remote Method Invocation (RMI)</li> <li>• Able to understand the multi-tier architecture of web-based enterprise applications using Enterprise JavaBeans (EJB).</li> </ul>
MSC-304(B)	System Software (Elective -III)	<p><b>COURSE OBJECTIVES:</b></p> <p>The main objective of this course work is to learn basic concepts of system software' and design of system software's. It also explores the other system software components converter like assembler, loader, linker, microprocessors and system software tools.</p> <p><b>COURSE OUTCOMES:</b> The students will be</p> <ul style="list-style-type: none"> <li>• Able to demonstrate the ability to think critically and analyze problems.</li> <li>• Able to find effective solutions to achieve desired objective.</li> <li>• Able to demonstrate the ability to analyze, design programs to demonstrate basic knowledge of systems software systems.</li> <li>• Able to demonstrate the assembler, loader, linker, microprocessors and system software tools.</li> </ul>
MSC-304(C)	Neural Network (Elective-III)	<p><b>COURSE OBJECTIVES:</b></p> <p>The main objective of this course is to develop the skills to gain a basic understanding of neural network theory. It also introduce to artificial neural networks from an engineering perspective.</p> <p><b>COURSE OUTCOMES:</b></p>

		<p>The students will be</p> <ul style="list-style-type: none"> <li>• Able to understand the fundamentals concept of neural networks</li> <li>• Able to understand the supervised learning and unsupervised learning and their applications.</li> <li>• Able to explore and understand the application of neural network like classification, prediction and pattern reorganization.</li> </ul>
MSC-305(A)	Web Technology (Elective –IV)	<p><b>COURSE OBJECTIVES:</b> The main objective of this course work is to explore the basics concept of the Internet. It explores various scripting languages like HTML, DHTML, Java script and semi structure programming language like XML.</p> <p><b>COURSE OUTCOMES:</b> The student will be</p> <ul style="list-style-type: none"> <li>• Able to understand and uses of internet and its applications.</li> <li>• Able to implement interactive web page(s) using HTML, CSS and JavaScript.</li> </ul>
MSC-305(B)	Pattern Recognition (Elective-IV)	<p><b>COURSE OBJECTIVES:</b> The main objective of this course is to explore the basic concept of pattern recognition, classification and machine learning. This course explores the various algorithms of classification and pattern recognition. It also explores the evolutionary computing techniques and advantages of ensemble classifiers.</p> <p><b>COURSE OUTCOMES:</b> The students will be</p> <ul style="list-style-type: none"> <li>• Able to understand and application of classification and pattern recognition techniques.</li> <li>• Able to explore and uses of various optimization techniques in various fields.</li> <li>• Able to understand the application and advantages of ensemble model.</li> </ul>
MSC-305(C)	Compiler Design (ELECTIVE-IV)	<p><b>COURSE OBJECTIVES:</b> The Objectives of this course is to explore the principles, algorithms, and data structures involved in the design and construction of compilers. Topics include context-free grammars, lexical analysis, parsing techniques, symbol tables, error recovery, code generation, and code optimization.</p>

		<p><b>COURSE OUTCOMES:</b> The students will be able</p> <ul style="list-style-type: none"> <li>• To learn basic concept used in compiler construction such as lexical analysis, top down and bottom up parsing, context sensitive analysis, and intermediate code generation.</li> <li>• To learn software tools used in compiler constructor such as lexical analyzer generators and parser generators.</li> <li>• To implement a compiler for a small programming language.</li> </ul>
<p>MSC (CS)- 4<sup>th</sup> Semester</p>	<p>Project Work</p>	<p><b>COURSE OBJECTIVES:</b></p> <ul style="list-style-type: none"> <li>• To prepare students to excel in computer applications to succeed in industry/ technical profession.</li> <li>• To provide students with solid foundation in technical, mathematical and computing fundamentals are required to solve related problems and also to pursue higher studies and research.</li> <li>• To train students with good computing breadth so as to comprehend, analyze, design and create computing solutions for the real life problems.</li> </ul> <p><b>COURSE OUTCOMES:</b> After successfully completing course student will be able to</p> <ul style="list-style-type: none"> <li>• Discover potential research areas in the field of IT.</li> <li>• Conduct a survey of several available literatures in the preferred field of study.</li> <li>• Compare and contrast the several existing solutions for research challenge.</li> <li>• Demonstrate an ability to work in teams and manage the conduct.</li> <li>• Formulate and propose a plan for creating a solution for the research plan identified.</li> <li>• To report and present the findings of the study conducted in the preferred domain.</li> </ul>