

DEPARTMENT OF COMPUTER SCIENCE

B. Sc. Computer Science

Program Outcomes:

Knowledge outcomes:

After completing B.Sc. Computer Science Program students will be able to:

PO1: To develop problem solving abilities using a computer.;

PO2: To prepare necessary knowledge base for research and development in Computer Science.

Skill outcomes:

After completing B.Sc. Computer Science Program students will be able to:

PO3: To build the necessary skill set and analytical abilities for developing computer based solutions for real life problems.

PO4: communicate scientific information in a clear and concise manner both orally and in writing.

PO5: To train students in professional skills related to Software Industry.

Generic outcomes:

Students will

PO6: Have developed their critical reasoning, logic judgment and communication skills.

PO7: Augment the recent developments in the field of IT and relevant fields of Research and Development.

PO8: Enhance the scientific temper among the students so that to develop a research culture and Implementation the policies to tackle the burning issues at global and local level.

Program Specific Outcomes

PSO1: Students get knowledge and training of technical subjects so that they will be technical professional by learning C programming, Relational Database Management, Data Structure, Software Engineering, Graphics, Java, PHP, Networking, Theoretical Computer Science, System programming, Object Oriented Software Engineering.

PSO2: Students understand the concepts of software application and projects.

PSO3: Students understand the computer subjects with demonstration of all programming and theoretical concepts with the use of ICT.

PSO4: Development of in-house applications in terms of projects

PSO5: Students will build up programming, analytical and logical thinking abilities.

PSO6: Aware them to publish their work in reputed journals

PSO7: To make them employable according to current demand of IT Industry and responsible citizen.

Course Outcomes

F. Y. B.Sc. Computer Science-Semester I & Semester II (Autonomous)

Course 22-CS-111: Problem Solving using Computer and ‘C’ Programming

After successfully completing this course, students will be able to:

- CO1: Students will understand algorithms and flowchart for solving problems using computers. CO2: Students will understand and can choose the loops and decision-making statements to solve the problem.
- CO3: Student will implement different Operations on arrays and will use functions to solve the given problem.
- CO4: To enrich the students in logic development required for programming.
- CO5: To help the students to build carrier in various branches of software development.

Course 22-CS-112 Database Management Systems

After successfully completing this course, students will be able to:

- CO1: Will understand the fundamental concepts of database.
- CO2: Will understand user requirements and frame it in data model.
- CO3: Will understand creations, manipulation and querying of data in databases
- CO4: Solve real world problems using appropriate set, function, and relational models.
- CO5: Design E-R Model for given requirements and convert the same into database tables.
- CO6: Use SQL.

Course 22-CS103 : Practical course on Problem Solving using Computer and ‘C’ programming and Database Management Systems

On completion of this course, students will be able to :

- CO1: Devise pseudocodes and flowchart for computational problems. CO2: Write, debug and execute simple programs in ‘C’.
- CO3: Create database tables in PostgreSQL. CO4: Write and execute simple, nested queries.
- CO3: Solving the exercises through Virtual Lab

On completion of the course, student will be able to–

- CO1: Design E-R Model for given requirements and convert the same into database tables. CO2: Use database techniques such as SQL & PL/SQL.
- CO3: Explain transaction Management in relational database System. CO4: Use advanced database Programming concepts

Course 22-CS121 Advanced ‘C’ Programming

On completion of the course, Student will be able to :-

- CO1: Study advanced concepts of programming using the ‘C’ language. CO2: Design and develop solutions to real world problems using C.
- CO3: To Develop modular programs using control structures, pointers, arrays, strings and structures
- CO4: Understand code organization with complex data types and structures CO5: Work with files.

Course 22-CS122 : Relational Database Management Systems

On completion of the course, student will be able to–

- CO1: Design E-R Model for given requirements and convert the same into database tables. CO2: Use database techniques such as SQL & PL/SQL.
- CO3: Explain transaction Management in relational database System. CO4: Use advanced database Programming concepts

Course 22-CS123 : Practical Course on Advanced ‘C’ Programming and Relational Database Management Systems

On completion of this course, students will be able to :

CO1: Write, debug and execute programs using advanced features in ‘C’. CO2: To use SQL & PL/SQL.

CO3: To perform advanced database operations.

CO4: Practical on Virtual laboratories.

Mathematics Paper I : 22-MTC-111 : Matrix Algebra

CO1: Students will get equipped with the knowledge of various properties of matrices and how matrices help in solving problems in different dimensions.

CO2: Students will be able to perform certain algorithms, justify why these algorithms work, and give some estimates of the running times of these algorithms.

CO3: Students will be able to solve linear systems both by using different methods.

CO4: Students will develop their basics for the course of Linear Algebra of second semester.

CO5: Students will be able to write cohesive and comprehensive solutions to exercises and be able to defend their arguments.

Mathematics Paper II : 22-MTC-112 : Discrete Mathematics

CO1: The logical thinking of student will be developed.

CO2: Student will be able to apply mathematical foundations to design computer based algorithms.

CO3: Enhances in the ability of student to develop the algorithms.

CO4: Student will be able to translate the presented information in Mathematical form and draw the relevant conclusion using his mathematical knowledge.

CO5: Help in solving a very wide variety of practical problems.

Semester 2

Mathematics paper I : 22-MTC-121 Linear Algebra

CO1: Students will get equipped with the knowledge of various spaces and the functioning on those spaces.

CO2: Students will be able to perform operations on spaces which are different from the usual spaces.

CO3: Students will also learn how linear algebra helps in solving real life problems using computers.

CO4: Students will develop an appreciation for the literature on the subject and be able to read and present results from the literature.

CO5: Students will be able to write cohesive and comprehensive solutions to exercises and be able to defend their arguments.

Mathematics paper II : 22-MTC-122 : Graph Theory

CO1: Able to work with graphs and identify certain parameters.

CO2: Develop the skill of converting mathematical problem graphically and vice-versa.

CO3: Motivates to solve real life problems.

CO4: Develop suitable techniques of analysis of problems.

CO5: Enable students to develop a positive attitude towards mathematics as an interesting and valuable subject to study.

Electronics Paper I

22-ELC-111: Semiconductor Devices and Basic Electronic Systems (2 Credits, 36 lectures)

After completion of this course student will be able:

- CO1. To analyze performance parameters based on study of characteristics of electronic devices like diode, transistors and MOSFETs.
- CO2. To analyze the Regulated Power supply using discrete components and using ICs.
- CO3. To analyze the signal generating circuits- Oscillators and study their applications.
- CO4. To build and test Data converters such as Analog to Digital and Digital to analog converters.

Electronics Paper-II

22-ELC-112: Principles of Digital Electronics(2 Credits, 36 lectures)

After completion of this course student will be able:

- CO1. To solve problems based on inter-conversion of number systems
- CO2. To study methods to reduce logic circuits by reducing Boolean expression.
- CO3. To understand the operation of all types of Logic Gates, their families etc.
- CO4. To understand the design and function of different Combinational Logic circuits.

Electronics Paper-III

22-ELC-113[P]: ELECTRONICS LAB IA (1.5 Credits)

Learning outcomes: After completion of this course student will be able

- CO1. To identify different components and devices as well as their types and basic parameters.
- CO2. To understand the use of various measuring Instruments and operate the devices in the laboratory .
- CO3. To connect circuit and do required performance analysis
- CO4. To compare expected and actual results of given particular experiment.
- CO5. To analyze the output of the circuits through Observation Tables and Graphical representation.

SEMESTER II

Electronics Paper I

22-ELC-121: Instrumentation Systems(2 Credits, 36 lectures)

Learning outcomes: After completion of this course student will be able

- CO1. To understand the Instrumentation System and role of Sensors along with their types.
- CO2. To understand the specifications of different sensors .

CO3. To understand the use of different Sensors and Actuators.

CO4. To realize the Smart Instrumentation system and analyze the use of Smart Sensors.

CO5. To understand the use of Operational Amplifier as a Signal conditioning element.

Electronics Paper II

22-ELC-122 : Basics of Computer Organization(2 Credits, 36 lectures)

Learning outcomes: After completion of this course student will be able

CO1.To understand the working of different Sequential logic circuits

CO2.To understand working operations of different types of Flip flops as a basic building block.

CO3. To know the operations of shift registers and Binary Counters

CO4. To understand the basic Computer System and general organization of different blocks.

CO5. To understand the organization of memory in the Computer system and know different types of Memories.

Electronics Paper III

22-ELC-123[P]: Electronics Lab IB(1.5 Credits)

Learning outcomes: After completion of this course student will be able

CO1. To experience activity based learning through hobby projects ,Market survey Industrial visits.

Or

CO 2. To learn the project development process through Circuit Simulation and other tools.

CO 3. To understand the working operations of various sensors.

CO 4. To know the use of Operational Amplifier.

CO 5. To understand the operation of different Sequential Circuits.

CO 6. To know the functional operation of memories.

Statistics PAPER-I

22-CSST-111 Descriptive Statistics (SEM I)

CO1: Students will understand the concept of Statistical data. They will understand how to collect and condense data using various statistical methods and how to classify and represent that data graphically.

CO 2: Students will learn through various statistical measures such as measures of central tendency, dispersion.

CO 3: Students will understand the concept of comprehensive introduction to descriptive statistics which are required for becoming computer professional.

CO 4: Students will be able to describe the moments skewness and kurtosis.

CO 5: Students will be able to understand the concept of Attributes.

Statistics PAPER-II

22-CSST-112 Mathematical Statistics (SEM I)

CO1: Students will understand the concept of Probability. They will understand how to determine

deterministic and non-deterministic models, events, random experiment and how to calculate numerical problems using real life data.

CO 2: Students will learn conditional probability and Bayes theorem which is useful for calculating posterior probabilities.

CO 3: Students will understand the concept random variables and types of random variables.

CO 4: Students will be able to obtain the probability distributions of random variables.

CO 5: Students will understand the concept of discrete random variables and will be able to apply the standard discrete probability distributions like Binomial, Poisson, Geometric to different real life situations

Statistics PAPER-I

22-CSST-121 Methods of Applied Statistics (SEM II)

CO1: Students will understand the concept of Correlation of two or more variables.

CO 2: Students will understand the concept of Regression of two interrelated variables

CO 3: Students will be able to Concept of Multiple Regression and Multiple & Partial Correlation.

CO 4: Students will be able to Solve the problems based on Multiple Regression and Multiple & Partial Correlation.

CO 5: Students will be able to understand the concept of Time Series.

Statistics:PAER-II

22-CSST-122 Discrete Probability distributions and Testing of hypothesis SEM –II

CO1: Students will understand the concept of Continuous random variables and will be able to apply the standard Continuous probability distributions like Exponential, Pareto, Normal to different real life situations

CO 2: Students will learn concept and Definitions Related to Testing of hypothesis.

CO 3: Students will understand the concept Parametric Tests like Large Sample Test, Small Sample Tests.

CO 4: Students will be able to obtain the random numbers and pseudo random numbers using Simulation.

CO 5: The students are expected start using some statistical software and verify their theoretical knowledge about different statistical entities and computations during practical sessions using MS-Excel.

S. Y. B.Sc. Computer Science-Semester I (2019 pattern)

Computer Science Theory Paper I

Course CS-231: Data Structures and Algorithms-I

After successfully completing this course, students will be able to:

CO1. Use well-organized data structures in solving various problems.

CO2. Differentiate the usage of various structures in problem solution.

CO3. Implement algorithms to solve problems using appropriate data structures.

Computer Science Theory Paper II
Course CS 232 Software Engineering

After successfully completing this course, students will be able to:

- CO1. Compare and chose a process model for a software project development.
- CO2. Identify requirements, analyze and prepare models.
- CO3. Prepare the SRS, Design document, Project plan of a given software system.

Computer Science Paper III
CS 233 Practical course on CS 231 and CS 232

After successfully completing this course, students will be able to:

- CO1. Prepare a detailed statement of problem for the selected mini project
- CO2. Identify suitable process models for the same.
- CO3. Develop Software Requirement Specification for the project.
- CO4. Identify scenarios and develop UML Use case
- CO5. Other artifacts: Class Diagram, activity diagram, sequence diagram, component diagram and any other diagrams as applicable to the project.

T. Y. B.Sc. Computer Science-Semester I (2019 pattern)

Course CS 331: System Programming

After successfully completing this course, students will be able to:

- CO1: Students will understand the design and implementation of System programs.
- CO2: Students will understand the role of System programs in program development.
- CO3: Students will able to differentiate between System program and Application program.
- CO4: Students will be able to analyze the working of Simulation of simple computer SMAC0
- CO5: Students will understand the design structure of a simple editor, Assembler and macro processor for hypothetical simulated computer.
- CO6: Students will understand the working of linkers and loaders and other development utilities.
- CO7: Students will understand Complexity of Operating system as software.

Course CS 332: Theoretical Computer Science

After successfully completing this course, students will be able to:

- CO1: Design a finite automaton to recognize a given regular language.
- CO2: Transform a language into regular expression or finite automaton or transition graph and define deterministic and nondeterministic finite automata.
- CO3: Prove properties of regular languages and classify them.
- CO4: Define relationship between regular languages and context-free grammars.
Prove properties of regular languages and classify them.
- CO5: Building a context-free grammar for pushdown automata.
- CO6: Determine whether a given language is context-free language or not and
Prove properties of context-free languages.
- CO7: Design Turing machine and Post machine for a given language.
- CO8: Students are exposed to a broad overview of the theoretical foundations of computer science

Course CS 333: Computer Networks I

After successfully completing this course, students will be able to:

CO1: Students will get acquainted with fundamentals of Networking like PAN, LAN, MAN, WAN, topologies and Home & Business applications of Networks.

CO2: Students will clear their basic concepts about the standards, their need & types of standards.

CO3: Students will know the design issues for the layers, layered architecture of the Network Models & functions performed at each layer.

CO4: Students will come to know the role played by different addresses at different layers of the network models.

CO5: Students will understand very basic networking hardware like transmission media types & tools description.

CO6: Students will be able to understand the need and importance of protocols at each layer in the communicating computers.

Course CS 334: Internet Programming I

After successfully completing this course, students will be able to:

CO1: Students will gain deep understanding of the use and implementation of HTML 5 and PHP language.

CO2: Students will be able to write well-structured, easily maintained, standards-compliant, responsive HTML code.

CO3: Students will get acquainted with Object Oriented Web applications.

CO4: Students will be able to create PHP programs that use various PHP library functions, files and directories manipulations.

CO5: Students will understand database connection & information retrieval from database.

CO6: Students will be able to apply a structured approach to identifying needs, interests, and functionality of a website.

Course CS 335: Programming in Java I

After successfully completing this course, students will be able to:

CO1: Students will learn about the basic concepts of Object-Oriented Programming language like Objects, Classes, Inheritance, Polymorphism etc.

CO2: They will implement those concepts in programming using Java language.

CO3: They will get an insight of how to handle unexpected problems and conditions in programming code and mechanisms of how to recover from them.

CO4: They will understand the concepts of designing Graphical User Interface and client side program execution on browser.

CO5: They will work on how to create files and transfer data to and from files through program coded in Java.

Course CS 336: Object Oriented Software Engineering

After successfully completing this course, students will be able to:

CO1: To inculcate the Analytical and thinking ability.

CO2: To develop structured sets of simple user-defined classes using Object-Oriented principles to achieve overall programming goals.

CO3: To understanding the significance of Object Orientation Technique in Software engineering.

CO4: To employ formal methods to produce effective software designs as solutions to specific tasks.

CO5: To locate, read and summarize relevant literature, from both traditional and electronic media, to extend understanding of the topic.

CO6: To understand the components of Unified Modeling Language (UML) by learning the all Symbolic notation.

CO7: To understand techniques and diagrams related to structural modeling as well as behavioral modeling.

CO8: To develop error identification and testing strategies for code development by understanding techniques of Object-Oriented analysis, object-oriented design and object

oriented testing.

T. Y. B.Sc. Computer Science Practical -Semester I & II

Course CS 347: Lab Course I: System Programming & Operating System

After successfully completing this course, students will be able to:

CO1: Design and implement System programs with minimal features to understand their complexity.

CO2: Design and implement simulations of operating system level procedures.

Course CS 348: Lab Course II: Programming in Java

After successfully completing this course, students will be able to:

CO1: Implement core Java programs to solve simple problems.

CO2: Implement Client and Server end Java programs.

Course CS 349: Lab Course III: Programming in PHP & Project

After successfully completing this course, students will be able to:

CO1: Implement Simple PHP programs to solve simple problems

CO2: Study basics of Networking concepts & develop a project in java or PHP.

