

# UNDERGRADUATE PROGRAMME: COURSE OUTCOME

**Name of the Programme: B. Sc. (Computer Science)**

Name of the Class	Course Code	Course Title	Course Outcomes	
<b>SEMESTER I</b>				
F.Y.B.Sc. (Computer Science)	CS - 101	Problem Solving Using Computer and 'C' Programming - I	CO1	Explore algorithmic approaches to problem solving.
			CO2	Develop modular programs using control structures and arrays in 'C'.
F.Y.B.Sc. (Computer Science)	CS - 102	Database Management Systems	CO1	Solve real world problems using appropriate set, function, and relational models
			CO2	Design E-R Model for given requirements and convert the same into database tables.
			CO3	Use SQL.
F.Y.B.Sc. (Computer Science)	CS - 103	Practical course on Problem Solving using Computer and 'C' programming and Database Management Systems	CO1	On completion of this course, students will be able to .Devise pseudo codes and flowchart for computational problems.
			CO2	Write, debug and execute simple programs in 'C'.
			CO3	Create database tables in postgresQL.
			CO3	Write and execute simple, nested queries.
<b>SEMESTER II</b>				
F.Y.B.Sc. (Computer Science)	CS - 201	Advanced 'C' Programming	CO1	The student will be able to Develop modular programs using control structures, pointers, arrays, strings and structures
			CO2	The student understands the importance Design and develop solutions to real world problems using C.
F.Y.B.Sc. (Computer Science)	CS - 202	Relational Database Management Systems	CO1	On completion of the course, student will be able to 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 responsible for our performance in life.
			CO4	Use advanced database Programming concepts.

F.Y.B.Sc (Computer Science)	CS - 203	Practical Course on Advanced 'C' Programming and Relational Database Management Systems	CO1	On completion of this course, students will be able to : Write, debug and execute programs using advanced features in 'C'.
			CO2	To use SQL & PL/SQL
			CO3	To perform advanced database operations

### SEMESTER III

S.Y.B.Sc (Computer Science).	CS - 231	Data Structures and Algorithms – I	CO1	On completion of the course, student will be able to To use well-organized data structures in solving various problems..
			CO2	To differentiate the usage of various structures in problem solution
			CO3	Implementing algorithms to solve problems using appropriate data structures.

S.Y.B.Sc. (Computer Science).	CS - 232	Software Engineering	CO1	On completion of the course, student will be able to 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.

S.Y.B.Sc. (Computer Science).	CS - 233	Practical course on CS 231 (Data Structures and Algorithms I) and CS 232 (Software Engineering)	CO1	student will be able to To use well-organized data structures in solving various problems.
			CO2	Implementing algorithms to solve problems using appropriate data structures.
			CO3	Prepare detailed statement of problem for the selected mini project
			CO4	Identify suitable process model for the same
			CO5	Develop Software Requirement Specification for the project.
			CO6	Identify scenarios and develop UML Use case
			CO7	Other artifacts: Class Diagram, activity diagram, sequence diagram, component diagram and any other diagrams as applicable to the project.

### SEMESTER IV

S.Y.B.Sc.	CS - 241	Data Structures	CO1	On completion of this course students will
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(Computer Science).		and Algorithms - II		be able to Implementation of different data structures efficiently.
			CO2	The students will able to understand the Usage of well-organized data structures to handle large amount of data
			CO3	The students will be able to understand Usage of appropriate data structures for problem solving.
S.Y.B.Sc. (Computer Science).	CS - 242	Computer Networks-I	CO1	Have a good understanding of the OSI and TCP/IP Reference Models and in particular have a good knowledge of Layers.
			CO2	The learner understands the basic Understand the working of various protocols..
			CO3	Analyze the requirements for a given organizational structure and select the most appropriate networking architecture and technologies.
S.Y.B.Sc. (Computer Science)	CS - 243	Practical course on CS 241(Data Structures and Algorithms II) and CS 242 (Computer Networks I)	CO1	The students will able to understand the codes should be uploaded on either the local server, Moodle, Github or any open source LMS.
			CO2	To understand the basic commands run on cmd. And find the information about the computer pursuing the protocol and different types of address which is required to make communication possible over the network.
			CO3	To understand & identify the class full addressing in IPV4.
<b>SEMESTER V</b>				
T.Y.B.Sc. (Computer Science)	CS - 351	Operating Systems – I	CO1	After completion of this course students will be able to understand the concept of Processes and Thread Scheduling by operating system
			CO2	Synchronization in process and threads by operating system
			CO3	Memory management by operating system using with the help of various schemes.
T.Y.B.Sc. (Computer Science)	CS - 352	Computer Networks - II	CO1	On completion of the course, student will be able to Student will understand the different

				protocols of Application layer..
			CO2	Develop understanding of technical aspect of Multimedia Systems
			CO3	Develop various Multimedia Systems applicable in real time
			CO4	Identify information security goals.
			CO5	Understand, compare and apply cryptographic techniques for data security.
T.Y.B.Sc. (Computer Science)	CS - 353	Web Technologies - I	CO1	Learners shall be able to understand basic concepts and Web Page
			CO2	On completion of the course, student will be able to Understand how to develop dynamic and interactive Web Page
T.Y.B.Sc. (Computer Science)	CS - 354	Foundations of Data Science	CO1	On completion of the course, student will be able to– Perform Exploratory Data Analysis
			CO2	Obtain, clean/process, and transform data
			CO3	Detect and diagnose common data issues, such as missing values, special values, outliers, inconsistencies, and localization
			CO4	Demonstrate proficiency with statistical analysis of data.
			CO5	Present results using data visualization techniques
			CO6	Prepare data for use with a variety of statistical methods and models and recognize how the quality of the data and the means of data collection may affect conclusions.
T.Y.B.Sc. (Computer Science)	CS - 355	Object Oriented Programming using Java - I	CO1	On completion of the course, student will be able to– Understand the concept of classes, object, packages and Collections.
			CO2	To develop GUI based application.
T.Y.B.Sc. (Computer Science)	CS - 356	Theoretical Computer Science	CO1	On completion of the course, student will be able to– Understand the use of automata during language design.
			CO2	Relate various automata and Languages
T.Y.B.Sc. (Computer Science)	CS - 357	Practical Course based on CS - 351	CO1	After completion of this course students will be able to understand the concept of Process synchronization
			CO2	Processes and Thread Scheduling by operating system
			CO3	Memory management by operating system using with the help of various schemes

T.Y.B.Sc. (Computer Science)	CS - 358	Practical Course based on CS - 353 and CS - 354	CO1	Understand how to develop dynamic and interactive Web Page.
			CO2	Prepare data for use with a variety of statistical methods and recognize how the quality of the data may affect conclusions.
			CO3	Perform exploratory data analysis.
T.Y.B.Sc. (Computer Science)	CS - 359	Practical Course based on CS - 355	CO1	Use an integrated development environment to write, compile, run, and test simple object-oriented Java programs
			CO2	Read and make elementary modifications to Java programs that solve real-world problems.
			CO3	Validate input in a Java program.
T.Y.B.Sc. (Computer Science)	CS-3510	Python Programming	CO1	On completion of the course, student will be able to– Develop logic for problem solving
			CO2	Determine the methods to create and develop Python programs by utilizing the data .
			CO3	structures like lists, dictionaries, tuples and sets.
			CO4	To be familiar about the basic constructs of programming such as data, operations, conditions, loops, functions etc.
			CO5	To write python programs and develop a small application project.
T.Y.B.Sc. (Computer Science)	CS-3511	Blockchain Technology	CO1	On completion of the course, student will be able to– Learn the fundamentals of Blockchain Technology.
			CO2	Learn Blockchain programming
			CO3	Basic knowledge of Smart Contracts and how they function.
<b>SEMESTER VI</b>				
T.Y.B.Sc. (Computer Science)	CS - 361	Operating Systems-II	CO1	After completion of this course students will be able to understand the concept of Management of deadlocks and File System by operating system
			CO2	Scheduling storage or disk for processes
			CO3	Distributed Operating System and its architecture and the extended features in mobile OS.

T.Y.B.Sc. (Computer Science)	CS - 362	Software Testing	CO1	To understand various software testing methods and strategies.
			CO2	To understand a variety of software metrics, and identify defects and managing those defects for improvement in quality for given software.
			CO3	To design test cases and test plans, review reports of testing for qualitative software.
			CO4	To understand latest testing methods used in the software industries
T.Y.B.Sc. (Computer Science)	CS - 363	Web Technologies - II	CO1	On completion of the course, student will be able to– Build dynamic website.
			CO2	Using MVC based framework easy to design and handling the errors in dynamic website
T.Y.B.Sc. (Computer Science)	CS - 364	Data Analytics	CO1	On completion of the course, student will be able to– Use appropriate models of analysis, assess the quality of input, and derive insight from results.
			CO2	Analyze data, choose relevant models and algorithms for respective applications
			CO3	Understand different data mining techniques like classification, prediction, clustering and association rule mining
			CO4	Apply modeling and data analysis techniques to the solution of real world business problems
T.Y.B.Sc. (Computer Science)	CS - 365	Object Oriented Programming using Java – II	CO1	On completion of the course, student will be able to– To access open database through Java programs using JDBC and develop the application
			CO2	Understand and Create dynamic web pages, using Servlets and JSP.
			CO3	Work with basics of framework to develop secure web applications.
T.Y.B.Sc. (Computer Science)	CS - 365	Object Oriented Programming using Java – II	CO1	On completion of the course, student will be able to– Access open database through Java programs using Java Data Base Connectivity (JDBC) and develop the application
			CO2	Understand and Create dynamic web pages, using Servlets and JSP.
			CO3	Work with basics of framework to develop secure web applications.

T.Y.B.Sc. (Computer Science)	CS - 366	Compiler Construction	CO1	On completion of the course, student will be able to– Understand the process of scanning and parsing of source code
			CO2	Learn the conversion code written in source language to machine language.
			CO3	Understand tools like LEX and YACC.
T.Y.B.Sc. (Computer Science)	CS - 367	Practical Course based on CS - 361	CO1	After completion of this course students will be able to understand the concept of Management of deadlocks by operating system
			CO2	File System management
			CO3	Disk space management and scheduling for processes
T.Y.B.Sc. (Computer Science)	CS - 368	Practical Course based on CS - 363 and CS - 364	CO1	Build dynamic website
			CO2	Using MVC based framework easy to design and handling the errors in dynamic website.
T.Y.B.Sc. (Computer Science)	CS - 369	Practical Course based on CS - 365	CO1	To Learn database Programming using Java
			CO2	Understand and Create dynamic web pages using Servlets and JSP.
			CO3	Work with basics of framework to develop secure web applications
T.Y.B.Sc. (Computer Science)	CS - 3610	Software Testing Tools	CO1	To understand various software testing methods and strategies
			CO2	To understand a variety of software metrics and identify defects and managing those defects for improvement in quality for given software.
			CO3	To design test cases and test plans, review reports of testing for qualitative software.
			CO4	To understand latest testing tools used in the software industries.
T.Y.B.Sc. (Computer Science)	CS - 3611	Project	CO1	To understand the use of technologies how it will be implemented while developing the project. And students must co-relate their knowledge and have confident to represent with well understanding facts.