CHHATRAPATI SAMBHAJI COLLEGE OF COMPUTER SCIENCE,
AURANGABAD
Plot No. 1, N-7, CIDCO, Aurangabad. Web Site : www.rjctaurangabad.com

INTERNAL QUALITY ASSURANCE CELL

2.6 STUDENT PERFORMANCE AND LEARNING OUTCOME

Programme Outcome (PO'S)
Course Outcome (CO'S)
Programme Specific Outcome (PSO'S)
Programme Educational Outcome (PEO'S)

Dr.NARENDRA JAIN
CHHATRAPATI SAMBHAJI COLLEGE
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B.Sc. Computer Science

Course Outcome

Paper No. CSO1 Computer Fundamentals

CO1:- On successful completion of this subject the students have overall introduction to Computer Hardware.

CO2:- Understanding the concept of input and output devices of Computers and how it works and recognize the basic terminology used in computer programming

Paper No. CSO2 Digital Electronics

CO1:- Understand the current voltage characteristics of semiconductor devices.

CO2:- Analyze dc circuits and relate ac models of semiconductor devices with their physical Operation

CO3:- Design and analyze of electronic circuits

CO4:- Evaluate frequency response to understand behaviour of Electronics circuits

Paper No. CSO4 Operating System

CO1:- Analyze the structure of OS and basic architectural components involved in OS design

CO2:- Analyze and design the applications to run in parallel either using process or thread models of different OS

CO3:- Analyze the various device and resource management techniques for timesharing and distributed systems

CO4:- Understand the Mutual exclusion, Deadlock detection and agreement protocols of Distributed operating system

Paper No. CSO5 Programming in C

CO1:- To demonstrate the ability to design creative solutions to real life problems faced by the industry.

CO2:- To communicate technical topics in written and verbal forms.

CO3:- Develops the use of the C programming language to implement various algorithms, and develops the basic concepts and terminology of programming in general

Paper No. CSO7 Advance C Programming

CO1:- To demonstrate the ability to design creative solutions to real life problems faced by the industry.

CO2:- To communicate technical topics in written and verbal forms.

CO3:- Develops the use of the C programming language to implement various algorithms, and develops the basic concepts and terminology of programming in general.

Paper No. CSO8 - Data Structure

CO1:- Select appropriate data structures as applied to specified problem definition.

CO2:- Implement operations like searching, insertion, and deletion, traversing mechanism etc. on various data structures.

CO3:- Students will be able to implement Linear and Non-Linear data structures.

CO4:- Implement appropriate sorting/searching technique for given problem.

Paper No. CSO11 - Programming in CPP

CO1:- Be able to understand the difference between object-oriented programming and procedural oriented language and data types in C++.

CO2:- Be able to program using C++ features such as composition of objects, Operator overloading, inheritance, Polymorphism etc.

CO3:- At the end of the course students will able to simulate the problem in the subjects like Operating system, Computer networks and real-world problems.

Paper No. CSO12 DBMS Using SQL

CO1:-Understand, analyze and apply common SQL statements including DDL, DML and DCL statements to perform different operations.

CO2:- Design different views of tables for different users and to apply embedded and nested queries.

CO3:- Design and implement a database for a given problem according to well known design principles that balance data retrieval performance with data consistency.

Paper No. CSO15 -Software Engineering

CO1:-Understand and demonstrate basic knowledge in software engineering.

CO2: Identify requirements, analyze and prepare models.

CO3:- Plan, schedule and track the progress of the projects.

CO4:- Design & develop the software projects.

CO5:- Identify risks; manage the change to assure quality in software projects.

CO6:- Apply testing principles on software project and understand the maintenance concepts.

Paper No. CSO16 -Web Designing

CO1: - Understand the functions of clients, servers, the HTTP protocol and HTML with scripting languages

CO2: - Be able to write a well-formed HTML page.

CO3: - Be able to employ Cascaded Style Sheets

CO4: - Perform a simple analysis of the structure of the web.

Paper No. CSO19 –Data Communication and Networking

CO1:- To explain how communication works in computer networks and to understand the basic terminology of computer networks.

CO2:- To explain the role of protocols in networking and to analyze the services and features of the various layers in the protocol stack.

CO3:- To understand design issues in Network Security and to understand security

threats, security services and mechanisms to counter them.

Paper No.CSO20 -E-Commerce

CO1:- Understand the basic concepts and technologies used in the field of management information systems.

CO2: Be aware of the ethical, social, and security issues of information systems

Choice Based Credit System

(w.e.f Academic year 2022-2023)

CMP-111 Computer Fundamental

CO1 Knowledge of computer fundamental, CPU and its functionality.
CO2 Understanding of block diagram of hardware peripherals.
CO3 Understanding the algorithms and flowcharts.
CO4 Understanding the concept of software and its types

CMP-112 Operating System

CO1 Gain knowledge of system software program and process.
CO2 Understand type of operating system, basic of operating system, evaluation of operating system.
CO3 Understand the concept of process. Process control block and thread.
CO4 Understand the CPU scheduling non-preemptive and preemptive scheduling algorithm.
CO5 Study about Memory and I/O management techniques.

CMP-211 Digital Electronic

CO1 Understand the computer system architecture, working gates and its functionality.
CO2 To impart basic knowledge in digital logic and circuit and to introduce basic concepts of data communication.
CO3 Learn to design basic logical circuit using commonly used combinational and sequential circuits.

CMP-212 Basic C Programming

CO1 Understand algorithmic thinking and problem solving and impart moderate skill in programming using C language in an industry standard.
CO2 Learn basic features, create, and execute simple C programs using conditional statements, loops and arrays.

B.Sc COMPUTER SCIENCE

Program Outcome

PO1:Engineering Knowledge: Apply the knowledge of algorithm, and programming to the solution of real time problems (**BL1**).

PO2:Problem Analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences (**BL4**).

PO3:Problem Solving Approach: Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline (**BL3**).

PO4:Skilled human resource for IT industry: The Programme assists to produce skill oriented human resource (**BL6**).

PO5:Scientific Problems: To formulate and analyse complex scientific problems (**BL4**).

PO6:Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the computer science practice (**BL3**).

Course Outcome

Paper No. Paper No. CS101 T Computer Fundamentals

CO1:- On successful completion of this subject the students have overall introduction to Computer Hardware.

CO2:- Understanding the concept of input and output devices of Computers and how it works and recognize the basic terminology used in computer programming

Paper No. CS102 T Digital Electronic

CO1:- Design and analyze of electronic circuits

CO2:- Evaluate the working of digital circuits such as register, filp flop, etc... response to understand behaviour of Electronics circuits

Paper No. CS103 T Microprocessor-I

CO1:- Assess and solve basic binary math operations using the microprocessor and explain the microprocessor internal architecture and its operation within the area of manufacturing and performance.

CO2:- Apply knowledge and demonstrate programming proficiency using the various addressing modes and data transfer instructions of the target microprocessor.

CO3:- Analyze assembly language programs

Paper No. CS104 T C Programming - I

CO1:- On successful completion of this subject the students have the knowledge about S/W and what are the languages to develop that.

CO2:-Understand the fundamentals of C programming including programming ability.

CO3:- Choose the loops and decision making statements to solve the problem.

CO4:- Implement different Operations on arrays

Paper No. CS105 T Communication Skill-I

CO1:- Understand the process of communication and its effect on giving and receiving information.

CO2:- Learn about historical and theoretical developments in the field of communication.

CO3:- Apply effective communication skills in a variety of public and interpersonal settings.

CO4:- Develop analytical, research, and organizational skills

Paper No. CS106 T Mathematical Foundation

CO1:- Ability to apply mathematical logic to solve problems.

CO2:- Understand sets, relations, functions and discrete structures.

CO3:- Able to use logical notations to define and reason about fundamental mathematical concepts such as sets relations and functions.

CO4:- Able to model and solve real world problems using graphs and trees

Paper No. CS201 T Data Structure

CO1:- Select appropriate data structures as applied to specified problem definition.

CO2:- Implement operations like searching, insertion, and deletion, traversing mechanism etc on various data structures.

CO3:- Students will be able to implement Linear and Non-Linear data structures, sorting / searching technique for given problem

Paper No. CS202 T Operating System

CO1:- Analyze the structure of OS and basic architectural components involved in OS design.

CO2:- Analyze and design the applications to run in parallel either using process or thread models of different OS.

CO3:- Analyze the various device and resource management techniques for timesharing and distributed systems.

CO4:- Understand the Mutual exclusion, Deadlock detection and agreement protocols of Distributed operating system.

Paper No. CS203 T Microprocessor – II

CO1:- The students will be able to implement 8086 assembly language programming

Paper No. CS204 T C Programming - II

CO1:- To demonstrate the ability to design creative solutions to real life problems faced by the industry.

CO2:- Develops the use of the C programming language to implement various algorithms, and develops the basic concepts and terminology of programming in general.

Paper No. CS205 T Communication Skill - II

CO1:- To demonstrate his verbal and non-verbal communication ability through presentations.

CO2:- To stimulate their Critical thinking by designing and developing clean and lucid writing skills.

CO3:- To demonstrate his verbal and non-verbal communication ability through presentations.

Paper No. CS206 T Numerical Computation Method

CO1:- Apply various interpolation methods and finite difference concepts.

CO2:- Work out numerical differentiation and integration whenever and wherever routine methods are not applicable.

CO3:- Work numerically on the ordinary differential equations using different methods through the theory of finite differences

Paper No. CS301 T Advance Data Structure

CO1:- To access how the choices of data structure & algorithm methods impact the performance of program.

CO2:- To Solve problems based upon different data structure & also write program

CO3:- Choose an appropriate data structure for a particular problem

Paper No. CS302 T Unix Operating System

CO1:- To have the ability to use a variety of common Unix commands and utilities.

CO2:- To have the ability to execute shell commands interactively and write shell scripts for at least two Unix Shells.

CO3:- Be familiar with basic Unix communications and networking commands.

Paper No. CS30 T PC Maintenance

CO1:- Introduced to a variety of operations and maintenance techniques, as well as safety and anti-virus procedures.

CO2:- Able to install and add operating system software and hardware, customize operating features, configure networks and provide basic PC support services.

CO3:- Personal Computer (PC) maintenance and repair, such as hardware and software installation, system optimization and basic troubleshooting

Paper No. CS304 T Programming in CPP

CO1:- Be able to understand the difference between object oriented programming and procedural oriented language and data types in C++.

CO2:- Be able to program using C++ features such as composition of objects, Operator overloading, inheritance, Polymorphism etc.

CO3:- At the end of the course students will able to simulate the problem in the subjects like Operating system, Computer networks and real world problems.

Paper No. CS305 T DBMS

CO1:- Understand, analyze and apply common SQL statements including DDL, DML and DCL statements to perform different operations.

CO2:- Design different views of tables for different users and to apply embedded and nested queries.

CO3:- Design and implement a database for a given problem according to well known design principles that balance data retrieval performance with data consistency

Paper No. CS306 T Statistical Method

CO1:- Organize, manage and present data.

CO2:- Analyze statistical data graphically using frequency distributions and cumulative frequency distributions.

CO3:- Analyze statistical data using measures of central tendency, dispersion and location.

CO4:- Identify the type of statistical situation to which different distributions can be applied

Paper No. CS401 T Software Engineering

CO1:- Understand and demonstrate basic knowledge in software engineering.

CO2:- Identify requirements, analyze and prepare models.

CO3:- Plan, schedule and track the progress of the projects.

CO4:- Design & develop the software projects.
CO5:- Identify risks; manage the change to assure quality in software projects.
CO6:- Apply testing principles on software project and understand the maintenance concepts.

Paper No. CS402 T Fedora

CO1:- Student get understand graphical environment which include GNOME and KDE.
CO2:- Understand the features of Fedora with installation.

Paper No. CS403 T Basic of Networking

CO1:- To explain how communication works in computer networks and to understand the basic terminology of computer networks.
CO2:- To explain the role of protocols in networking and to analyze the services and features of the various layers in the protocol stack.
CO3:- To understand design issues in Network Security and to understand security threats, security services and mechanisms to counter them

Paper No. CS404 T Core Java

CO1:- Explore the Java programming language.
CO2:- Work with Primitive Types, Strings and Interactive Input/Output.
CO3:- Manipulate the Flow of Control, Design/Create/Use Classes and Methods, Manipulate Classes and Methods.
CO4:- Program with Inheritance

Paper No. CS405 T Adv. DBMS

CO1:- To understand the basic concepts regarding database, know about query processing and techniques involved in query optimization and understand the concepts of database transaction and related database facilities including concurrency control, backup and recovery
CO2:- To understand the difference between DBMS and advanced DBMS and use of advanced database concepts and become proficient in creating database queries.

Paper No. CS406 T Web Fundamental

CO1:- Understand the functions of clients, servers, the HTTP protocol and HTML.
CO2:- Be able to write a well-formed HTML page.
CO3:- Be able to employ Cascaded Style Sheets.
CO4:- Be able to create simple web forms and process them with PHP.
CO5:- Understand elementary graph theor
CO6:- Perform a simple analysis of the structure of the web.•

Paper No. CS501 T Software Cost Estimation

CO1:- An ability to use the techniques, skills, and modern engineering tools necessary

for engineering practice.

CO2:- An ability to identify, formulate, and solve engineering problems.

CO3:- An ability to design a hardware and software system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability●

Paper No. CS502 T Basic of Android O.S

CO1:- Install and configure Android application development tools.

CO2:- Design and develop user Interfaces for the Android platform.

CO3:- Save state information across important operating system events.

CO4:- Apply Java programming concepts to Android application development.

Paper No. CS503 T Core JAVA - II

CO1:- Implement object oriented programming concepts.

CO2:- Use and create package and interfaces in a Java program.

CO3:- Use graphical user interface in Java programs

CO4:- Create applets.

CO4:- Connect with DataBase with JDBC

Paper No. CS504 T Basic of Computer Graphics

CO1:- the basics of computer graphics, different graphics systems and applications of computer Understand graphics

CO2:- Discuss various algorithms for scan conversion and filling of basic objects and their comparative analysis.

CO3:- Use of geometric transformations on graphics objects and their application in composite form.

CO5:- Extract scene with different clipping methods and its transformation to graphics display device

Paper No. CS506 T Basic of ASP.Net

CO1:- Be able to design web applications using ASP.NET.

CO2:- Be able to use ASP.NET controls in web applications.

CO3:- Be able to debug and deploy ASP.NET web applications.

CO4:- Be able to create database driven ASP.NET web applications and web services

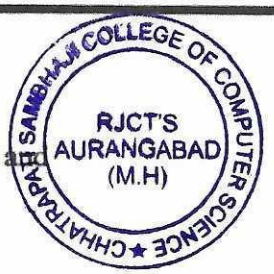
Paper No. CS508 T Advanced Networking

CO1:- Demonstrate Data Communications System and its components.

CO2:- Identify the different types of network devices and their functions within a network.

CO3:- Diagnose and resolve problems of a LAN and WAN.

CO4:- Familiarity with the basic protocols of computer networks, and how they can be used to assist in network design and implementation



Paper No. CS601 T Software Quality & Testing

CO1:- Apply modern software testing processes in relation to software development and project management.

CO2:- Create test strategies and plans, design test cases, prioritize and execute them.

CO3:- Manage incidents and risks within a project.

CO4:- Contribute to efficient delivery of software solutions and implement improvements in the software development processes.

CO5:- To gain expertise in designing, implementation and development of computer based systems and IT processes

Paper No. CS602 T Android Application Development

CO1:- Understand both the basic and advanced concepts of Android Development.

CO2:- Explain and use key Android programming concepts.

CO3:- Build Basic level mobile applications with Java on Android.

CO4:- Deploy the application on Google Play

Paper No. CS603 T Theory of Computation

CO1:- Will apply knowledge of computing and mathematics appropriate to the discipline.

CO2:- will function effectively as a member of a team in order to accomplish a common goal

Paper No. CS604 T Advanced Computer Graphics

CO1:- To make the students familiar with techniques of clipping, three dimensional graphics and three dimensional transformations

CO2:- The computer graphics course prepares students for activities involving in design, development and testing of modelling, rendering, shading and animation

Paper No. CS606 T Programming Language: C#

CO1:- Knowledge of the structure and model of the programming language C #.

CO2:- Use the programming language C # for various programming technologies.

CO3:- develop software in C # (application)

Paper No. CS607 T e-Commerce

CO1:- Understand the basic concepts and technologies used in the field of management information systems.

CO2:- Be aware of the ethical, social, and security issues of information systems

Choice Based Credit System (CBCS) Curriculum w .e. f- June 2022
Dr. Babasaheb Ambedkar Marathwada University, Aurangabad
First Year

CS-111T Computer Fundamental

CO1: Knowledge of computer fundamental, CPU and its functionality.
CO2: Understanding of block diagram of hardware peripherals.
CO3: Understanding the computer based application such as email and video conferencing.
CO4: Understanding the concept of software and its types

CS-112T Digital Electronics

CO1: Understand the computer system architecture, working gates and its functionality.
CO2: To impart basic knowledge in digital logic and circuit and to introduce basic concepts of data communication.
CO3: Learn to design basic logical circuit using commonly used combinational and sequential circuits.

CS-113T Operating Systems

CO1: Gain knowledge of system software program and process.
CO2: Understand type of operating system, basic of operating system, evaluation of operating system.
CO3: Understand the concept of process. Process control block and thread.
CO4: Understand the CPU scheduling non-preemptive and preemptive scheduling algorithm.
CO5: Understand the concept of synchronization and deadlock

CS-114T Programming in C

CO1: Understand algorithmic thinking and problem solving and impart moderate skill in programming using C language in an industry standard.
CO2: Learn basic features, create, and execute simple C programs using conditional statements, loops and arrays.

CS-115T Mathematical Foundation

CO1: Know how to represent various statement using set, relations, function, permutation and combination, group, graph, and tree.
CO2: Use logical notation to formulate and reason about fundamental mathematical concept such as sets, relation, function and algebraic structure.
CO3: Model and solve real world problem using graphs and trees.
CO4: Apply mathematical logic to solve problem, pigeonhole principle to solve real time problem.

CS-116T: Programming methodology

CO1: Learn the history and type of programming.

CO2: Learn various approach of writing program.
CO3: Learn to develop simple algorithm and flowchart to solve a problem.

CS-131T: English communication skill

CO1: Understand the different style of communication.
CO2: Understand the effective speaking skills and develops effecting reading comprehensions.
CO3: Understand how to write a good personal profile and improve one's presentation skill.
CO4: Develop good writing skill.

CS-132T: Marathi / Hindi

CO1:मराठीतील वैविध्यपूर्ण सुजनाविष्काराचा आस्वाद घेण्याची अभिरुची निर्माण करून कलाकृतीतील सौंदर्य स्थळांचा शोध घेण्याची वृत्ती वाढीस लावणे.
CO2:राष्ट्रीय एकात्मता व बंधुभाव वाढीस लागण्यास मदत करणे.
CO3:निवडक गद्य व काव्याच्या अनुषंगाने मराठी साहित्यातील विविध प्रवाहांचा परिचय करून घेणे.
CO4:उपयोजित मराठीच्या माध्यमातून रोजगाराभिमुख शिक्षण देऊन व्यावसायिक वृत्ती वाढविणे व स्वावलंबी बनवण्यास मदत करणे.

CS-211T Data Structures

CO1: Ability to understand fundamental data structures like arrays, linked-lists, stack, queues, trees, graphs.
CO2: Ability to understand abstract data types.
CO3: Ability to program data structures and use them in implementations of abstract data types.
CO4: Understanding of basic algorithmic complexity.
CO5: Ability to sensibly select appropriate data structures and algorithms for problems and to justify that choice.
CO6: Ability to understand searching and sorting algorithms, their implementation and suitable applications.

CS-212T 8086 Microprocessor

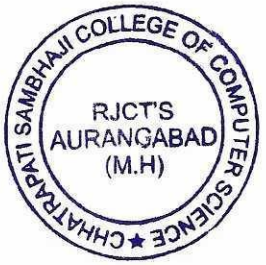
CO1: Functional block diagram of 8086 microprocessor
CO2: Functions of each pin of 8086 microprocessor
CO3: Use of instructions in different addressing modes
CO4: Write an assembly language program.

CS-213T Operating System-II

CO1: Gain knowledge of Memory Management, Paging and Segmentation.
CO2: Understand concept of File, Operation of file, File allocation methods.
CO3: Understand Disk fundamental, Disk Scheduling, Disk management.
CO4: Understand Dedicated devices, Shared devices, I/O Devices, I/O Hardware, Interrupts
CO5: Understand Security Policy Mechanism- Protection and Authentication.
CO6: Understand the basic introduction to Android Operating System.

CS-214T Advance Programming in C

CO1: Develop and implement modular applications in C using functions
CO2: Develop applications in C using structures and pointers
CO3: Design applications using sequential and random-access file processing
CO4: Identify the difference between call by value and call by reference.



CS-215T Numerical Methods M-2

CO1: Different number theory algorithms.
CO2: Calculate approximate value for using approximation techniques.
CO3: Solve numerical problems using different numerical methods.
CO4: Write algorithms of different numerical techniques.

CS-216T Database Management System

CO1: Design a database.
CO2: Normalize a database.
CO3: Create a database perform various operations on database.

CS-231T English Communication Skill (Soft Skill Development)

CO1: Understand the significance and essence of a wide range of soft skills.
CO2: Learn how to apply soft skills in a wide range of routine social and professional settings.
CO3: Learn how to employ soft skills to improve interpersonal relationships
CO4: Learn how to employ soft skills to enhance employ ability and ensure workplace and career success.

CS-232T Marathi / Hindi

CO1:मराठीतील वैविध्यपूर्ण सुजनाविष्काराचा आस्वाद घेण्याची अभिरुची निर्माण करून कलाकृतीतील सौंदर्य स्थळांचा शोध घेण्याची वृत्ती वाढीस लावणे.
CO2:राष्ट्रीय एकात्मता व बंधुभाव वाढीस लागण्यास मदत करणे.
CO3:निवडक गद्य व काव्याच्या अनुषंगाने मराठी साहित्यातील विविध प्रवाहांचा परिचय करून घेणे.
CO4:उपयोजित मराठीच्या माध्यमातून रोजगाराभिमुख शिक्षण देऊन व्यावसायिक वृत्ती वाढविणे व स्वावलंबी बनवण्यास मदत करणे.

Dr.NARENDRA JAIN
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