V. V. COLLEGE OF SCIENCE & TECHNOLOGY
(Affiliated to University of Calicut)
CHULLIMADA KANJIKODE
P G DEPARTMENT OF COMPUTER SCIENCE

MSc COMPUTER SCIENCE

Program Specific Objectives :

- PSO1.To equip students to take up challenging research oriented responsibilities and courses for their higher studies/profession.
- PSO2. To train and equip the students to meet the requirements of the Software industry in the country and outside.
- PSO3. To motivate and support the students to prepare and qualify challenging competitive examinations such as JRF/NET/JAM/GATE etc.

SEMESTER I

CSS1C02–ADVANCEDDATASTRUCTURES

Program Specific Objectives :

- PSO1. To provide the knowledge of basic data structures and their implementations.
- POS2. To understand importance of data structures in context of writing efficient programs.
- PSO3. To develop skills to apply appropriate data structures in problem solving.

Course Outcomes :

- CO1. Understand the concept of Dynamic memory management, data types, algorithms, Big O notation.
- CO2. Understand basic data structures such as arrays, linked lists, stacks

and queues.

- CO3. Describe the hash function and concepts of collision and its resolution methods
- CO4. Solve problem involving graphs, trees and heaps
- CO5. Apply Algorithm for solving problems like sorting, searching, insertion and deletion of data.

CSS1C04–THE AR TOF PROGRAMMING METHODOLOGY

Program Specific Objectives :

- PSO1 To introduce the concept of algorithmic approach for solving real-life problems.
- PSO2 To develop competencies for the design and coding of computer programs.
- PSO3 To learn designing programs with advanced features of C.
- PSO4 To learn the art of designing algorithms and flowcharts.

CSS1C05–COMPUTER ORGANIZATION & ARCHITECTURE

Course Outcomes:

- CO1 To familiarize with the digital fundamentals, computer organization,compute rarchitecture and assembly language programming.

SEMESTER II

CSS2C06– DESIGN AND ANALYSIS OF ALGORITHMS

Course Outcomes:

- CO1 Analyze the asymptotic performance of algorithms.

- CO2 Write rigorous correctness proofs for algorithms.
- CO3 Demonstrate a familiarity with major algorithms and data structures.
- CO4 Apply important algorithmic design paradigms and methods of analysis.
- CO5 Synthesize efficient algorithms in common engineering design situations.

CSS2C07–OPERATING SYSTEM CONCEPTS
Course Outcomes

- CO1 Introduce the underlying principles of an operating system.
- CO2 Exposure of multi programming, virtual memory and resource management concepts. Case study of public and commercially available operating systems

CSS2C08–COMPUTER NETWORKS

Course Outcomes:

- CO1 To provide the student with a top down approach of networking starting from the application layer.
- CO2 To introduce computer networking in the back drop of Internet protocol stack.

CSS2C09–COMPUTATIONAL INTELLIGENCE

Course Outcomes:

- CO1 Introduce concepts of Artificial Intelligence and Machine Learning

CSS2C10 –PRINCIPLES OF SOFTWARE ENGINEERING

Course Outcomes:

- CO1 develop familiarity with software engineering principles and practices.
- CO1 To have an understanding about the process of product/literature survey, techniques of problem definition, and methods of report writing

CSS2L02 – PRACTICAL II

Course Outcomes:

- CO1: To practically implement the theory portions covered in the courses Operating System Concepts (CSS2C07) and Computer Networks (CSS2C08) and toextend theprogramming knowledge acquired through course The Art of Programming Methodology (CSS1C04).

CSS2A02 – TERM PAPER (PROFESSIONAL COMPETENCY AUDIT COURSE)

Course Outcomes:

- CO1 To introduce the student to the techniques of literature survey.
- CO2 To acquaint him/her with the process of presenting his/her work through seminars and technical reports.

SEMESTER III

CSS3C11 – ADVANCED DATABASE MANAGEMENT SYSTEM

Course Outcomes:

- CO1 To understand the relational model, and know how to translate requirements captured in an Entity-Relationship diagram into a relational schema.
- CO2 To reason about dependencies in a relational schema.
- CO3 To understand normal form schemas, and the decomposition process by which normal forms are obtained.
- CO4 To familiarize with advanced SQL' statements.
- CO5 To understand advanced features of database technologies.

CSS3C12 – OBJECT ORIENTED PROGRAMMING CONCEPTS

Course Outcomes:

- CO1 To learn object oriented concepts and programming concepts and methodologies and to learn its implementation using Java.

CSS3C13 – PRINCIPLES OF COMPILERS

Course Outcomes:

- To introduce the fundamental concepts and various phases of compiler design.

CSS3L03 – PRACTICAL III

Course Outcomes:

- To practically implement the theoretical aspects covered in Advanced Database Management System (CSS3C11) and Object Oriented Programming Concepts(CSS3C12) and to extend the programming knowledge acquired through The Art ofProgramming Methodology (CSS1C04) to encompass object oriented techniques.

CSS3E01c–WEBTECHNOLOGY
Course Outcomes:

- To introduce the tools for creating and maintaining websites – content development (HTML), client side scripting (JavaScript), web server (Apache), server sidescripting(PHP)and content management system(Joomla!).

SEMESTER IV

CSS4P01 – PROJECT WORK

Course Outcomes:

- CO1 To give a practical exposure to the process of software development life cycle.
- CO2 To develop a quality software solution by following the software engineering

  principles and practices.
- CO3 Students are also encouraged to take up a research oriented

work to formulate a research problem and produce results based on its implementation/simulation/experimental analysis.

BACHELOR OF COMPUTER APPLICATION

Course Objective

SEMESTER -1

BCA1B01 – Computer Fundamentals and HTML

Course Outcomes:

- CO1 Familiar with fundamental concepts of Computer hardware and software
- CO2 Have knowledge of different Number system, Digital codes and Boolean algebra
- CO3 Understand the problem-solving aspect
- CO4 Demonstrate the algorithm and flow chart for the given problem.
- CO5 Design a Webpage with CSS

BCA1C01 – Mathematical Foundation for Computer Applications

Course Outcomes:

- CO1: Learn the basic principles of linear algebra and vectors.
- CO2: Familiar with Determinant and Matrices.
- CO3: Formulate Limit, Continuity and Differentiability.
- CO4: Learn the basic principles of differential and integral Calculus
- CO5: Demonstrate a working knowledge Definite and Indefinite Integrals.
- CO6: Learn the mathematical modeling using ordinary and partial differential equations

BCA1C02 – Discrete Mathematics

Course Outcomes:

- CO1 To equip the students with basic principles of discrete mathematics

- CO2 To learn the mathematical logic, set theory & Boolean Algebra

- CO3 To understand the basic concept of graphs and trees.

SEMESTER 2

BCA2B02 – Problem Solving Using C

Course Outcomes:

- CO1 Interpret the basic principles of C Programming.

- CO2 Acquire decision making and looping concepts.

- CO3 Design and develop modular programming.

- CO4 Explore usage of Arrays, strings, structures, union and files.

- CO5 Effective utilization of pointers and dynamic memory allocation.

BCA2B03 - Programming Laboratory I: Lab Exam of 1st& 2nd Semester – HTML and Programming in C

Course Outcomes:

- CO1 Analyze a web page and identify its elements and attributes.

- CO2 Create web pages using HTML5 and Cascading Style Sheets.

- CO3 Design and develop a webpage with Hyperlinks.

- CO4 Enhance their analyzing and problem solving skills and use the same for writing programs in C.

- CO5 To write diversified programs using C language

BCA2C03 – Financial and Management Accounting

Course Outcomes:

- CO1 To get a general introduction on accounting and its general application.

- CO2 To get a general understanding on various tools for financial statement analysis.

- CO3 To get a general understanding on accounting procedures up to the preparation of various financial statements.

- CO4 To get a general understanding of the important tools for managerial decision making.

BCA2C04 - Operations Research

Course Outcomes:

- CO1 To formulate a real-world problem as a mathematical model.
- CO2 To find solutions for the mathematical models using LPP, Assignment and Transportation methods
- CO3 Formulate and solve problems as networks and graphs.
- CO4 To use CPM and PERT techniques to plan, schedule and control the

    activities of a project.

SEMESTER 3

XXXXA11– Python Programming

Course Outcomes:

- CO1 Explain basic principles of Python programming language

- CO2 Implement decision making and loop statements in Python,.

- CO3 Implement GUI applications using Python

- CO4 Explain modular programming concepts using Python

- CO5 Familiarize with List, Tuple, Dictionary concepts in Python

XXXXA12 -Sensors and Transducers

Course Outcomes:

- CO1 Explain resistance, inductance and capacitance transducers.

- CO2 Perceive the concepts of temperature and pressure transducers.

- CO3 Perceive the concepts level transducers such as and flow transducers

- CO4 Explain Electromagnetic transducers and radiation sensors

- CO5 Explain force and torque transducers and sound transducers

BCA3B04 – Data Structures Using C

Course Outcomes:

- CO1 To be familiar with fundamental data structures and with the manner in which these data structures can best be implemented; become accustomed to the description of algorithms in both functional and procedural styles

- CO2 To have knowledge of complexity of basic operations like insert, delete, search on these data structures.
- CO3 Ability to choose a data structure to suitably model any data used in computer applications.

- CO4 Design programs using various data structures including hash tables, Binary and general search trees, graphs etc.

- CO5 Implement and know the applications of algorithms for sorting, pattern matching

BCA3C05- Computer Oriented Numerical & Statistical Methods
 Course Outcomes:

- CO1 To compute solution of algebraic and transcendental equation by numerical methods like Bisection method and Newton Raphson method.
- CO2 To recognize elements and variables in statistics and summarize qualitative and

quantitative data.

- CO3 To calculate the mean, median and mode for individual series.
- CO4 To outline the properties of correlation and compute Karl-Pearson's coefficient of correlation

BCA3C06 –Theory of Computation
Course Outcomes:

- CO1 To discuss key notions of computation, such as algorithm and decidability through problem solving.

- CO2 To explain the models of computation, including formal languages, grammars and automata, and their connections.

- CO3 To analyze and design finite automata, pushdown automata and Turing machines.

- CO4 To solve computational problems regarding their computability and complexity and prove the basic results of theory of computation.

SEMESTER-4

XXXXA13– Data Communication and Optical Fibers

Course Outcomes:

- CO1 To Acquaint with the structure of Data Communications System and its components.
- CO2 To Familiarize with different network terminologies and transmission media
- CO3 To gain knowledge of the different multiplexing techniques ,Telephone system, Mobile System-GSM
- CO4 To become familiar with the functions of a Datalink layer and Switching
- CO5 To acquire the knowledge of Optical Fibre Cable and its working

XXXXA14- Microprocessors-Architecture and Programming

Course Outcomes:

- CO1 To study general architecture of microprocessor

- CO2 To write assembly language programs, both simple programs and interfacing programs

- CO3 To know how to interface peripheral devices with 8085

- CO4 To study the architecture of 8086 microprocessor

BCA4B05 – Database Management System and RDBMS

Course Outcomes:

- CO1 Gain knowledge of data base systems and data base management system software.

- CO2 Ability to model data in applications using conceptual modeling tools such as ER Diagrams and design data base schemas based on the model.

- CO3 Formulate, using SQL, solutions to a broad range of query and data update problems.

- CO4 Demonstrate an understanding of normalization theory and apply such knowledge to the normalization of a database.

- CO5 Be acquainted with the basics of transaction processing and concurrency control.

BCA4B06- Programming Laboratory II: Lab Exam of 3rdand 4th Semester - Data Structures and RDBMS

Course Outcomes:

- CO1 Make use of typical data definitions and manipulation commands.

- CO2 Test the implementation of nested and join queries.

- CO3 Develop simple application using views, sequences and synonyms.

- CO4 Inspect and implement applications that require front-end tools.

- CO5 Familiarizing with different data structures tools like searching, sorting, Linked List etc.

BCA4C07- E-Commerce
Course Outcomes:

- CO1 Understand basics of electronic commerce framework

- CO2 Understand the various models of E-Commerce

- CO3 Understand the basics of networks and E-marketing

- CO4 Understanding the security, legal and ethical issues in E Commerce.

- CO5 Analyzing the e-payment systems and designing the payment system

BCA4C08- Computer Graphics
Course Outcomes:

- CO1 To understand the basics of computer graphics, different graphics systems and applications of computer graphics.

- CO2 To learn various algorithms for scan conversion and filling of basic objects.

- CO3 To know the use of geometric transformations on graphics objects and their application in composite form.

- CO4 To learn different clipping methods and its transformation to graphics display device.

- CO5 To make students familiar with different color models and image manipulation using GIMP

SEMESTER V

BCA5B07- Computer Organization and Architecture

Course Outcomes:

- CO1 To make students understand the basic structure, operation and characteristics of a digital computer.

- CO2 To familiarize with Computer Instruction and Interrupt Design

- CO3 To make students know the different types of control unit and Addressing Modes

- CO4. To familiarize with the Memory organization including cache memories and virtual memory

- CO5 To understand the I/O devices and standard I/O interfaces

BCA5B08- Java Programming

Course Outcomes:

- CO1 Knowledge of the structure and model of the Java programming language.

- CO2 Use the Java programming language for various programming technologies.

- CO3 Develop software in the Java programming language.

- CO4 Evaluate user requirements for software functionality required to decide whether the Java programming language can meet user requirements

BCA5B09 -Web Programming using PHP
Course Outcomes:

- CO1 To understand basics of the Internet and World Wide Web
- CO2 To learn basic skill to develop responsive web applications

- CO3 To acquire the knowledge of HTML and CSS

- CO4 To understand basic concept of client side scripting language –

     javascript

- CO5 To understand the server side scripting language -PHP.

BCA5B10 -Principles of Software Engineering

Course Outcomes:

- CO1 To learn engineering practices in Software Development.

- CO2 Select and implement different software development process models.

- CO3 Extract and analyse software requirements specifications for different

  projects.

- CO4 Develop some basic level of software architecture/design.

- CO5 Define the basic concepts and importance of Software project management concepts like cost estimation, scheduling and reviewing the progress.

BCA5D02 - Web Designing

Course Outcomes:

- CO1 Learn Hypertext markup language

- CO2 Learn Web designing using HTML, Dhtml

- CO3 Familiarize with Javascript and HTML Editor (Frontpage/Bluefish)

SEMESTER VI

BCA6B11- Android Programming

Course Outcomes:

- CO1 To gain knowledge of developing end user application using Android SDK

- CO2 To familiarize with Android Resources

- CO3 To acquaint with user interfaces development in Android

- CO4 To acquire knowledge about creating menus and operating files in

  Android

BCA6B12- Operating Systems

Course Outcomes:

- CO1 To understand the objectives, functions and types of Operating System
- CO2 To have a basic knowledge about process, Threads, Deadlock
- CO3 To understand the knowledge of Linux shell programming
- CO4 To learn about CPU scheduling and memory management

BCA6B13- Computer Networks

Course Outcomes:

- CO1 To understand about different network terminologies

- CO2 To familiarize with different layers of network

- CO3 To understand the functions of data link layer and network layer

- CO4 To familiarize with the functions of Transport layer

- CO5 To understand the concept of network security and Cryptography

BCA6B14-Programming Laboratory III: Lab Exam of Vth Semester Java

and PHP Programming
Course Outcomes:

- CO1 To learn about the Object Oriented Concepts in Java

  Programming

●CO2 To understand the practical knowledge of Web Programming

      using PHP

BCA6B15-Programming Laboratory IV: Lab Exam of Android and

Linux Shell Programming

Course Outcomes:

● CO1 To learn the practical knowledge of Android Programming

● CO2 To familiarize with the practical knowledge of shell programming

BCA6B16A -System Software

Course Outcomes:

● CO1 To learn about the concept of system software

● CO2 To understand the knowledge of Macros and macro processors

● CO3 To Familiarize with Loaders and Linkers

PROGRAM OUTCOMES FOR BCA

● PO1. Computational Knowledge: Understand and apply mathematical   foundation,
computing and domain knowledge for the conceptualization of computing
models from defined problems.

● PO2.   Problem Analysis: Ability to identify, critically analyze and formulate complex computing problems using fundamentals of computer science and application domains.

● PO3. Design / Development of Solutions: Ability to transform complex business scenarios and contemporary issues into problems, investigate, understand and propose integrated solutions using emerging technologies.

● PO4. Conduct Investigations of Complex Computing Problems: Ability to devise and conduct experiments, interpret data and provide well informed conclusions.

- PO5. Modern Tool Usage: Ability to select modern computing tools, skills and techniques necessary for innovative software solutions

- PO6. Professional Ethics: Ability to apply and commit professional ethics and cyber regulations in a global economic environment.

- PO7. Life-long Learning: Recognize the need for and develop the ability to engage in continuous learning as a Computing professional.

- PO8. Project Management: Ability to understand management and computing principles with computing knowledge to manage projects in multidisciplinary environments.

- PO9. Communication Efficacy: Communicate effectively with the computing community as well as society by being able to comprehend effective documentations and presentations.

- PO10. Societal & Environmental Concern: Ability to recognize economical, environmental, social, health, legal, ethical issues involved in the use of computer technology and other consequential responsibilities relevant to professional practice.

- PO11. Individual & Team Work: Ability to work as a member or leader in diverse teams in multidisciplinary environment.

- PO12. Innovation and Entrepreneurship: Identify opportunities, entrepreneurship vision and use of innovative ideas to create value and wealth for the betterment of the individual and society.

B SC COMPUTER SCIENCE

Course objective

SEMESTER -1

BCS1B01 – COMPUTER FUNDAMENTALS AND HTML

Course Outcomes:

- CO1 To equip the students with fundamentals of Computer

- CO2 To learn the basics of Computer organization

- CO3 To equip the students to write algorithm and draw flow chart for solving simple problems

- CO3 To learn the basics of Internet and webpage design

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SEMESTER- 2

BCS2B02 – Problem Solving Using C

Course Outcomes:

- CO1 To equip the students with fundamental principles of Problem Solving aspects.

- CO2 To learn the concept of programming

- CO3 To study C language

- CO4 To equip the students to write programs for solving simple computing problems

BCS2B03 - Programming Laboratory I: Lab Exam of 1st & 2nd Semester - HTML and Programming in C

Course Outcomes:

- To make the students learn web designing

- To make the students learn programming environments.

- To practice procedural programming concepts

- To make the students equipped to solve mathematical or scientific problems using C

SEMESTER 3

XXXXA11– Python Programming

Course Outcomes:

● CO1 Explain basic principles of Python programming language

● CO2 Implement decision making and loop statements in Python,.

● CO3   Implement GUI applications using Python

● C04 Explain modular programming concepts using Python

● C05   Familiarize with List, Tuple, Dictionary concepts in Python

XXXXA12 -Sensors and Transducers

Course Outcomes:

● CO1 Explain resistance, inductance and capacitance transducers.

● CO2 Perceive the concepts of temperature and pressure transducers.

● CO3 Perceive the concepts level transducers such as and flow transducers

● CO4 Explain Electromagnetic transducers and radiation sensors

● CO5 Explain force and torque transducers and sound transducers

BCS3B04 – Data Structures Using C

Course Outcomes:

● CO1 To introduce the concept of data structures
● CO2 To make the students aware of various data structures
● CO3 To equip the students implement fundamental data structures

SEMESTER-4

XXXXA13– Data Communication and Optical Fibers

Course Outcomes:

- CO1 To Acquaint with the structure of Data Communications System and its components.
- CO2 To Familiarize with different network terminologies and transmission media
- CO3 To gain knowledge of the different multiplexing techniques ,Telephone system, Mobile System-GSM
- CO4 To become familiar with the functions of a Datalink layer and Switching
- CO5 To acquire the knowledge of Optical Fibre Cable and its working

XXXXA14- Microprocessors-Architecture and Programming

Course Outcomes:

- CO1 To study general architecture of microprocessor
- C02 To write assembly language programs, both simple
- C03 programs and interfacing programs
- CO5 To know how to interface peripheral devices with 8085
- C06 To study the architecture of 8086 microprocessor

BCS4B05 – Database Management System and RDBMS

Course Outcomes:

- C01 To learn the basic principles of database and database design
- C02 To learn the basics of RDBMS
- C03 To learn the concepts of database manipulation SQL
- C04 To study PL/SQL language

BCS4B06- Programming Laboratory II: Lab Exam of 3rd and 4 th Semester - Data Structures and RDBMS

Course Outcomes:

- CO1 To make the students equipped to solve mathematical or scientific problems using C
- C02 To learn how to implement various data structures.
- CO3 To provide opportunity to students to use data structures to solve real life problems.

SEMESTER-5

BCS5B07 Computer Organization and Architecture

Course Outcomes:

- C01 To learn logic gates, combinational circuits and sequential circuits
- C02 To learn basics of computer organization and architecture

BCS5B08 Java Programming

Course Outcomes:

- CO1 To review on concept of OOP.
- CO2 To learn Java Programming Environments
- C03 To practice programming in Java
- CO4 To learn GUI Application development in JAVA.

BCS5B09 Web Programming using PHP

Course Outcomes:

- CO1 To review on concept of OOP.
- CO2 To learn Java Programming Environments.
- CO3 To practice programming in Java
- CO4 To learn GUI Application development in JAVA.

BCS5B10 Principles of Software Engineering

Course Outcomes:

- CO1 To learn engineering practices in Software development.

- CO2 To learn various software development methodologies and practices.

- CO3 To learn and study various Evaluation methods in Software Development.

CS5D02 - Web Designing

Course Outcomes:

- CO1 Learn Hypertext markup language
- CO2 Learn Web designing using HTML, Dhtml
- CO3 Familiarize with Javascript and HTML Editor (Frontpage/Bluefish)

SEMESTER-6

BCS6B11 Android Programming

Course Outcomes:

- CO1 To have a review on concept of Android programming.
- CO2 To learn Android Programming Environments
- CO3 To practice programming in Android.
- CO4 To learn GUI Application development in Android platform with XML

BCS6B12 Operating Systems

Course Outcomes:

- CO1 To learn objectives & functions of Operating Systems.
- CO2 To understand processes and its life cycle.
- CO3 To learn and understand various Memory and Scheduling Algorithms.
- CO4 To have an overall idea about the latest developments in Operating Systems

BCS6B13 Computer Networks

Course Outcomes:

- CO1 To learn about transmissions in Computer Networks.
- CO2 To learn various Protocols used in Communication.
- CO3 To have a general idea on Network Administration.

BCS6B14 Programming Laboratory III: Lab Exam of Vth Semester Java and PHP Programming

Course Outcomes:

- CO1 To practice Java programming.
- CO2 To practice client side and server side scripting.
- CO3 To practice PHP Programming.
- C04 To practice developing dynamic websites.
- CO5 To practice how to interact with databases through PHP.

BCS6B15 Programming Laboratory IV: Lab Exam of Android and Linux Shell Programming

Course Outcomes:

- CO1 To practice Android programming.
- CO2 To practice user interface applications
- CO3 To develop mobile application.
- CO4 To practice shell programming

BCS6B17 Industrial Visit and Project Work

Course Outcomes:

- CO1 To provide practical knowledge on software development process

BCS6B16a System Software

Course Outcomes:

- CO1 To build fundamental knowledge in system software.
- CO2 To learn functions of various system software.
- CO3 To learn specifically learn compilation process of a program.

PROGRAM OUTCOMES FOR BCS CS

- PO1: To develop problem solving abilities using a computer.;
- PO2: To prepare necessary knowledge base for research and development in Computer Science.
- 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.
- 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