Union Christian College, Aluva

Affiliated to Mahatma Gandhi University, Kottayam, India

NAAC Re-Accredited with A Grade in IVth cycle

Department of Computer Science

Name of Programme	Program Outcomes
BSc Computer Science	**PO1. Critical Thinking and Analytical Reasoning:** Analyze, and evaluate evidence and arguments critically, so as to formulate logical arguments and develop in-depth knowledge through critical evaluation of practices, policies and theories. **PO2. Scientific Reasoning and Problem Solving:** Interpret and analyse quantitative/qualitative data and experimental evidences to draw unbiased conclusions, and develop problem solving skills. **PO3. Communication skills:** Develop intensive and extensive listening skills, analytical reading and writing skills so as to express oneself confidently. **PO4. Leadership Skills:** Demonstrate democratic values in employing effective team-building and management strategies to work constructively and lead diverse teams. **PO5. Equity, Inclusiveness and sustainability:** Appreciate equity, inclusiveness and sustainability and acquire values of unity, secularism and national integration with a commitment to social service and thereby emerge as dignified citizens. **PO6. Moral and Ethical Reasoning:** Recognise different value systems in conducting one's life, demonstrate the ability to identify ethical issues related to professional life. **PO7. Lifelong Learning:** Acquire skills for 'learning how to learn' and develop skills for self-paced and self-directed learning so as to adapt to the changing demands of the workplace through reskilling.
Name of Programme	**Program Specific Outcomes**

BSc Computer Science	**PSO1:** To impart theoretical & practical knowledge in areas related to Computer Science. **PSO2:** To develop the ability to analyze a problem, identify and define the computing requirements, which may be appropriate to its solution. **PSO3:** To attract young minds to the potentially rich & employable field of computer applications. **PSO4:** To be a foundation graduate programme which will act as a feeder course for pursuing advanced studies and research in the area of Computer Science/Applications. **PSO5:** To train & equip the students to meet the requirement of the Industrial standards. **PSO6:** To train computer scientists who can work on real life challenging problems. **PSO7:** To produce entrepreneurs who can innovate and develop software products and applications.

Semester	Course Name	Course Outcomes
First	***Computer Fundamentals and Basics of PC Hardware EL1CMT05***	CO1. Get Introduced to computers, different generations and classifications of computers CO2. Get acquainted with Computer Hardware CO3. Understand different expansion slots, serial and parallel ports, usb etc CO4. Learn about different input devices like keyboard, mouse, trackball, light pen etc CO5. Learn about different output devices like monitor, printer etc CO6. Understand the concept of memory and its various types i.e primary memory and secondary memory
	Methodology of Programming and C Language CS1CRT02	CO1. Understand the advantages of a high level language like C and the basic programming process. CO2. Apply good programming principles to the design and implementation of C programs. CO3. Design, implement, debug and test programs using the fundamental elements of C. CO4. Understand primitive data types, values, operators, selection and looping constructs in C.

		CO5. Ability to define and manage basic data structures based on problem subject domain. CO6. Ability to work with textual information, characters and strings. CO7. Apply different data-structures like arrays, pointers, structures and files. CO8. Ability to handle possible errors during program execution.
	Fundamentals of Digital Systems EL1CMT06	CO1. Idea about different types of codes CO2. Working of logic gates inside a computer CO3. Simplification of logic equations to minimize circuit CO4. Combinational logic systems and sequential logic systems CO5. Basic building blocks of memory CO6.Working of counters and sequential circuits
	Software Lab-I CC1CRP01	CO1. Develop the logic for a given problem. CO2. Construct the algorithm and a flow chart for a given problem. CO3. Recognize and understand the syntax and construction of C code. CO4. Understand the steps involved in compiling, linking and debugging C code. CO5. Use different data-structures like arrays, pointers, structures ,user-defined functions and files. CO6. To know the alternative ways of providing solution to a given problem
	English	
	Mathematics 1	
Second	***Data Communication EL2CMT07***	CO1. Understand the components of a data communications system CO2. Understand basics of data ,signals and their transmission in a data communications network. CO3. Identify key considerations in selecting various transmission media in networks. CO4. Understand basics of data ,signals and their transmission in a data communications network. CO5. Understand switching techniques in data communication
	Computer Organization and Architecture (Core) CS2CRT05	CO1.Interpret the functional architecture of computing systems CO2.Understand the basics of hardwired and micro-programmed control of the CPU CO3. Explain addressing modes, instruction formats and program control statements CO4. Distinguish the organization of various parts of a system memory hierarchy CO5. Describe basic concept of parallel computing CO6. Describe fundamentals concepts of pipeline and vector processing

	Object Oriented Programming using C++ CS2CRT06	CO1. Thorough idea about object oriented programming concepts CO2. Class , object relationships CO3. Different types of functions and reusability of code CO4. Memory manipulation
	Software Lab-II CC2CRP02	CO1. Idea about all object oriented programming concepts supported by C++
	English –II	
	Maths – II	
Third	***Probability and Statistics ST3CMT41***	CO1. Organize, manage and present data. CO2. Analyze statistical data using measures of central tendency. CO3. Use the basic probability rules, including additive and multiplicative laws, using the terms, independent and mutually exclusive events. CO4. Translate real-world problems into probability models. CO5. Derive the probability density function of transformation of random variables. CO6. Develop problem-solving techniques needed to accurately calculate probabilities.
	Database Management Systems CC3CRT01	CO1. have a broad understanding of database concepts and database management system CO2. have a high-level understanding of major DBMS components and their functions CO3. be able to model an application's data requirements using conceptual modeling tools like ER diagrams and design database schemas based on the conceptual model. CO4. be able to write SQL commands to create tables and indexes, insert/update/delete data, and query data in a relational DBMS. CO5. be able to improve the database design by normalization
	System Analysis and Design CC3CRT02	CO1. Information systems and tools for analysis and design of them CO2. Different cycles in development of systems, analyze, design , develop and operate CO3. Maintenance and up gradation
	Networking Fundamentals EL3CMT08	CO1. Understanding the basics concept of Computer Network CO2. Get to know about the functions of different layers of the Network model and focus on Data link layer functions

		CO3. Learn about the data link layer functions and Networking Addressing system CO4. Understand the Network Layer functions and Transport Layer protocols CO5. Get acquainted with Congestion Control techniques and Application Layer Protocols.
	Data Structures using C++ (Core) CS3CRT08	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. CO5. Design advance data structure using Non-Linear data structure.
	Software Lab – III CC3CRP03	**I. SQL Commands** CO1. Learn and execute basic SQL commands CO2.Implement complex nested queries CO3.Implement views and stored procedures CO4.Get acquainted with Access control and privilege commands. **II. Data Structures using C++** 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. CO5. Design advance data structure using Non-Linear data structure.
Fourth	***LINUX Administration CS4CRT10***	CO1. Introduce the Linux Operating System – architecture, features and basic commands CO2. Learn the essential Linux commands CO3. Will be able to develop Shell Programs CO4. Get acquainted with different System Administration commands in Linux CO5. Will be able to use different filter commands in Linux CO6. Understand different servers – DHCP, DNS, squid, Apache, Telnet, FTP, Samba
	Microprocessor and Assembly	CO1. About a computer processor CO2. Types and features of each and advantages CO3. Program the processor directly

	Language Programming EL4CMT09	CO4. How new processors are developed and their necessities
	Computer Aided Optimization Techniques (core) CC4CRT03	CO1. Understand the essential features and scope of optimization techniques - Learn properties of objective function and formalization of optimization problem. CO2. Be able to model engineering minima/maxima problems as optimization problems. CO3. Learn numerical methods to find optimum point and value of a function - Learn to solve the LPP CO4. Learn to solve transportation problems and assignment problems. - Apply in real life situations CO5. Facility with the design, implementation, and analysis of computational experiments.
	Web Programming Techniques CS4CRT11	CO1. .will be familiar with client server architecture and able to develop a web application using PHP CO2. Select and apply markup languages for processing, identifying, and presenting of information in web pages. CO3. Use scripting languages and web services to transfer data and add interactive components to web pages. CO4. Combine multiple web technologies to create advanced web components.
	Assembly Language Programming Lab CC4CRP05	CO1. Acquaint with programming the processor directly using machine language. CO2. Power of assembly language programming CO3. Base for an embedded system development
	Software Lab IV CC4CRP04	CO1. Will be able to create static web pages using HTML CO2. Will be able to create and style the web pages using CSS CO3. Will be able to create dynamic web pages using PHP
Fifth	***System Software and Operating System CC5CRT04***	CO1. To learn the fundamentals of Operating Systems. CO2. To understand the working of OS as a resource manager, file system manager, process manager, memory manager and I/O manager and methods used to implement the different parts of OS.

		CO3.To learn the mechanisms of OS to handle processes , synchronization and their communication and various issues in Inter Process Communication (IPC). CO4.To learn the mechanisms involved in memory management , deadlocks handling, file management.
	IT and Environment CS5CRT13	CO1. Understand the basic concepts of Internet and multidisciplinary nature of environment studies CO2. Understand about the impact of IT in E-learning and describe the tools used in teaching and learning. Explain about the various Learning management Systems CO3. Describe IT industry in terms of new opportunities and threats (Software piracy, cyber crime) and possible solutions (cyber laws). Understand the various health issues associated with the usage of computers and guidelines of proper usage CO4. Get acquainted about E-waste problems and E-waste management CO5. Will get to know about the history of Human Rights and the basics of UDHR – International Human Rights documents CO6. Explain United Nation System and the committees involved in various aspects of Human Rights CO7. Get acquainted with Human Rights in India and the functions of National Human Rights commission and State Human Rights Commission
	Java Programming using Linux CS5CTR14	CO1. Clear cut idea about new generation object oriented language. CO2. Application and webpage program developments CO3. Audio and graphics processing
	Computer Security (Core) CC5CRT05	CO1. Learn concepts of computer security, cryptography, digital money, secure protocols, detection and other security techniques. CO2. Good understanding of the concepts and foundations of computer security, and identify vulnerabilities of IT systems. CO3. Understand the basic security tools to enhance system security and can develop basic security enhancements in stand-alone applications CO4 . Compare and contrast symmetric and asymmetric encryption systems and their vulnerability to attack CO5. Able to understand, appreciate, employ, design and implement appropriate security technologies and policies to protect computers and digital information.
	Open Course CS5OPT02	CO1. Understand concepts for basic use of computer hardware, software, networks, and the Internet in the workplace CO2. Recognize when to use each of the Microsoft Office programs to create professional and academic documents.

		CO3. Use Microsoft Office Word to create personal, academic and business documents following current professional and/or industry standards. CO4. Use Microsoft Office Powerpoint Presentation to create academic and business presentations following current professional and/or industry standards. CO5. Use Microsoft Office Excel to perform calculations in academic and business area.
	Software Development Lab I (Mini Project) CC5PRP01	CO1. To implement the idea generated by different courses to develop a working model as a solution to a problem
Sixth	***Computer Graphic s CC6CRT06***	CO1. Understand the basics of computer graphics, different graphics systems and applications of computer graphics CO2. To learn the basic principles of 3- dimensional computer graphics. CO3. Provides an understanding of how to scan convert the basic geometrical primitives, how to transform the shapes to fit them as per the picture definition. CO4. Provides an understanding of mapping from a world coordinates to device coordinates, clipping, and projections. CO5. To implement various algorithms to Line drawing, circle drawing, scan convert the basic geometrical primitives, transformations, area filling, clipping. CO6. To describe the importance of viewing and projections. CO7. To define the fundamentals of animation, virtual reality and its related technologies.
	Big Data :Analytics CC6CRT07	CO1. Understand concept of big data systems and identify the main sources of Big Data in the real world. CO2. Understand the key issues in big data management and its associated applications in intelligent business and scientific computing. CO3. Demonstrate an ability to use frameworks like Hadoop, NOSQL to efficiently store retrieve and process Big Data for Analytics. CO4. Implement several Data Intensive tasks using the Map Reduce Paradigm CO5. Achieve adequate perspectives of big data analytics in various applications like recommender systems, social media applications etc.
	Programme Elective	CO1. Get introduced to Python programming Language CO2. Understand the control flow and data structures

	Python and Latex CC6CBT01	CO3. Understand Python functions – built in and user defined function CO4. Get acquainted with Files and User I/O CO5. Understand the basics of LaTeX
	Seminar CC6SMP01	CO1. How to study a topic by oneself and how to make others understand better.
	Software Development Lab II (Main Project) (Core) CC6 PRP02	CO1. Students will be able to understand the various stages of Software Development Life Cycle. CO2. They will be able to develop Software by using the various programming and software development skills learnt during the Course. CO3. Students learn new tools and technologies that can be used for Software development.
	Course Viva CC6VVP01	CO1. Will test student's knowledge about various subjects and will help them to overcome difficult areas in the subects