Nallamuthu Gounder Mahalingam College (Autonomous)

Pollachi

B. Sc. COMPUTER SCIENCE BATCH 2021-2024

Vision

Our dream is to make the College an institution of excellence at the national level by imparting quality education of global standards to make students academically superior, socially committed, ethically strong, spiritually evolved and culturally rich citizens to contribute to the holistic development of the self and society.

Mission

Training students to become role models in academic arena by strengthening infrastructure, upgrading curriculum, developing faculty, augmenting extension services and imparting quality education through an enlightened management and committed faculty who ensure knowledge transfer, instill research aptitude and infuse ethical and cultural values to transform students into disciplined citizens in order to improve quality of life.

DEPARTMENT OF COMPUTER SCIENCE

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Our vision is to make the department, a department of excellence at the international level by imparting need based Information Technology education of global industry standards to make students academically and technically sound, enriched with rich spiritual quotients, contribute to the overall development of the self, society and country.

Mission

Developing students to become role models as technocrats by imparting technical knowledge, recent curriculum in catering the needs of Information Technology industry and quality education through dedicated faculty and rejuvenate students into technically sound, in order to make globally fit and improve the standard of life.

Program Educational Objectives (PEOs)	
The **B. Sc. Computer Science** program describe accomplishments that graduates are expected to attain within five to seven years after graduation	
PEO1	To enrich knowledge in core areas related to the field of computer science and Mathematics.
PEO2	To provide opportunities for acquiring in-depth knowledge in Industry 4.0/5.0 tools and techniques and there by design and implement software projects to meet customer‘s business objectives.
PEO3	To enable graduates to pursue higher education leading to Master and Research Degrees or have a successful career in industries associated with Computer Science or as entrepreneurs
PEO4	To enhance communicative skills and inculcate team spirit through professional activities, skills in handling complex problems in data analysis and research project to make them a better team player.
PEO5	To embed human values and professional ethics in the young minds and contribute towards nation building.
PEO6	To develop project

Program Specific Outcomes (PSOs)	
After the successful completion of **B.Sc. Computer Science**program, the students areexpected to	
PSO1	**Software Development: Design** and develop computer programs/computer -based systems Development in the areas related to algorithms, languages, networking, web development, cloud computing, IoT and data analytics.
PSO2	**Education and Employment :** Ability to pursue higher studies of specialization and to take up technical employment

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PO9	**Emerging Technology Usage**: Ability to appreciate emergingtechnologies and tools.
PO10	**Decision Making** : Ability to apply decision making methodologies to evaluate solution for efficiency, effectiveness, and sustainability

21UCS517 - Core XI: Linux and Shell Programming

CO Number	CO Statement	Knowledge Level
CO1	Remember the history and fundamentals of Linux operating system	K1
CO2	Understand shell scripts, file and directory related commands	K2
CO3	Apply the commands for systems programming including file system programming and process management	K3
CO4	Analyze the file system, devices and backup management	K4
CO5	Evaluate the network administration services	K5

21UCS518-Core XII: Kotlin Programming

CO1	To remember the coding conventions used for kotlin programming.	K1
CO2	To get an idea about classes, objects, properties, fields and interfaces of kotlin.	K2
CO3	To deploy multi-platform mobile and web based applications.	K3
CO4	To analyze the composition of suspending functions.	K4
CO5	To validate the execution of applications on various platforms.	K5

21UCS519-Core XIII: Cyber Security

CO Number	CO Statement	Knowledge Level
CO1	Evaluate the computer network and information security needs of an organization.	K5
CO2	Assess cyber security risk management policies in order to adequately protect an organization's critical information and assets.	K2
CO3	Troubleshoot, maintain and update an enterprise-level information security system.	K3
CO4	Implement continuous network monitoring and provide real-time security solutions.	K4
CO5	Formulate, update and communicate short- and long-term organizational cyber security strategies and policies.	K5

21UCS5E1-Core Elective I : Data mining and Warehousing

CO Number	CO Statement	Knowledge Level
CO1	6. To remember the basics of data mining and data warehousing	K1
CO2	7. To understand the methodology of data mining and its best practices	K2
CO3	8. To analyze how data mining fits in with data warehousing, OLAP as well as architecture of data warehousing.	K4
CO4	9. To apply data for data mining	K3
CO5	10. To evaluate different kinds of patterns with many data mining algorithms	K5

21UCS5E2-Core Elective-I: Data Engineering with Google Cloud

CO1	To remember the concepts of Data and storage.	K1
CO2	To understand the idea of designing data models	K2
CO3	To Apply Data Engineering Concepts in building Data Processing Systems	K3
CO4	To Analyze the Operationalizing of Data Processing Systems.	K4
CO5	To evaluate the Data Processing System.	K5

21UCS5E3-Core Elective I: Mobile Application Development

CO Number	CO Statement	Knowledge Level
CO1	Understand the fundamentals and characteristics of mobile applicationand apply the right user interface for designing mobile application	K2, K3
CO2	Implement mobile application using UI toolkits and frameworks and also implement android application with multimedia support	K3
CO3	Design a mobile application that is aware of the resource constraints of mobile devices.	K5
CO4	Develop web based mobile application that accesses internet and location data	K5
CO5	Implement android application to use telephony for SMS communication	K3

21UCS520-Core Lab VII: Linux and Shell Programming Lab

CO Number	CO Statement	Knowledge Level
CO1	To Develop shell scripts for simple applications.	K3, K4, K5
CO2	To Develop programs to create and manage processes.	K3, K4, K5
CO3	To Develop programs for system administration	K3, K4, K5

21UCS521-Core Lab VIII: Programming Lab using Kotlin

CO1	To Recall programmingbasicswithcodingconventionsinkotlin Programming	K1
CO2	To Categorize classes,objects,Functions and lamdas in Intellijidea	K2
CO3	To Integrate views with different collections and grouping	K3
CO4	To Design and develop User interface functions in kotlin	K4
CO3	To Apply Java programming concepts to Android application development.	K5

21UCS5S1-Skill Enhancement Course-I: Word Press

CO Number	CO Statement	Knowledge Level
CO1	To apply the available templates for creating blogs or dynamic websites.	K3
CO2	To analyze the various plugins and apply them appropriately	K4
CO3	To validate the available content in the blog or website	K5

21UCS5S2-Skill Enhancement Course-I: Dream Weaver

CO Number	CO Statement	Knowledge Level
CO1	To apply the different controls in dreamweaver for creating a webpage	K3
CO2	To analyze the markup languages and using them based on the requirements	K4
CO3	To validate the webpage using javascript and create page layouts with CSS	K5

21UCS5S3-Skill Enhancement Course-I: Quantitative Aptitude Skills

CO Number	CO Statement	Knowledge Level
CO1	To remember the basic mathematics and its functions.	K1
CO2	To understand the various problems in the real world related to shapes, purchase, sales, interest.	K2
CO3	To apply the skills required for various problems.	K3
CO4	To analyze the illustration and steps involved in problem solving approach.	K4
CO5	To build the quantitative aptitude skills for solving various mathematical and application.	K5

21UCS622-Core XIV: R Programming

CO1	To remember the core to provide a conceptual understanding of the basics of R programming	K1
CO2	To understand the common programming Variable classes,Data frames and lists	K2
CO3	To deploy the concepts of Reading, creating and storing R -CSV file	K3
CO4	To figure out appropriate statistical tests using R	K4
CO5	To describe the various data visualization methods.	K5

21UCS6E4-Core Elective -II: Artificial Intelligence and Machine learning

CO1	To recall the basic logical searches, learning algorithms and improve decision making systems.	K1
CO2	To Summarize the idea about knowledge representation and reasoning	K2
CO3	To illustrate new knowledge with probabilistic reasoning solutions	K3
CO4	To Analyze Decision making system and its different process	K4
CO5	To evaluate the learning skills with many observations and machine learning algorithms	K5

21UCS6E5-Core Elective-II: Front-End Web Development with React

CO1	To remember the concepts of front end design.	K1
CO2	To understand the idea of designing and scripting web pages	K2
CO3	To Applyessential hacks and simple techniques to solve React application development challenges.	K3
CO4	To Analyze the to wield complex topics such as Webpack and server-side rendering..	K4
CO5	To Learn to maximize the performance of React applications .	K5

21UCS6E6-Core elective II: MongoDB

CO Number	CO Statement	Knowledge Level
CO1	Understand NoSQL database Design multiple tables, and using group queries.	K3
CO2	Design a database based on a data model normalization to a specified level	K4
CO3	Understand and apply various operators and queries in Mongo DB	K3
CO4	Develop a text processing skill set and able to apply in creation of	K4,K5
CO5	Design a secure database and analyze with security protocols	K4, K6

21UCS6E7-Core Elective-III: Information Retrieval

CO1	To remember the concepts of artificial intelligence and Information retrivel systems.	K1
CO2	To understand the idea of retrieval models with similarity measures and ranking	K2
CO3	To ApplyQueries using categorization and clustering	K3
CO4	To Analyze the filtering techniques using web search.	K4
CO5	To evaluate the extraction and integration of data with many applications.	K5

21UCS6E8-Core Elective-III : HTML, JavaScript and JQuery For web designing

CO1	To remember the concepts of basic web designing languages.	K1
CO2	To understand the idea of designing and scripting web pages	K2
CO3	To ApplyQueries using categorization and clustering	K3
CO4	To Analyze the validation and querying techniques using Javascript and jQuery.	K4
CO5	To evaluate the web forms for different applications.	K5

21UCS6E9-Core Elective III: Angular and Node JS

CO Number	CO Statement	Knowledge Level
CO1	Understand Client Side MVC and SPA	K2
CO2	Explore AngularJS Component and develop an Angular JS	K3,K4
CO3	Develop an AngularJS Single Page Application from scratch	K3,K6
CO4	Demonstrate an Understanding of the use of and Node.js core modules	K1,K3
CO5	Apply MongoDB ,Middleware and make connectivity with front end tools	K3,K6

21UCS623-Core Lab IX: R Programming Lab

CO1	To implement Vector R operations	K3
CO2	To review and analyze data frames and objects	K4
CO3	To validate how Bar charts and Pie charts are implemented	K5

21UCS624-Core Lab X: Advanced Applications in MS Excel Lab

CO1	To implement, Interpret data using MS Excel.	K3
CO2	To review and analyze the mathematical functions, data analytics using MS Excel	K4
CO3	To validate the macros and manipulation for objects and data using MS Excel	K5

21UCS6S4-Skill Enhancement Course-II: Joomla

CO1	To apply the basic concepts to solve real world problems using Joomla	K3
CO2	To analyze design issues in developing various applications	K4
CO3	To validate Web based applications	K5

21UCS6S5-Skill Enhancement Course-II: Macromedia Director

CO1	To apply the basic tools of macromedia director.	K3
CO2	To analyze specialized tools and implement it in animation.	K4
CO3	To validate website designing using the scripts.	K5

21UCS6S6-Skill Enhancement Course-II: Soft Skills

CO1	To remember the basics of communication skills	K1
CO2	To understand the relationship between leadership networking and team work	K2
CO3	To apply the skills required for a good leadership	K3
CO4	To analyze the causes of stress and its impact	K4
CO5	To build the interpersonal skills for being an effective goal oriented team player.	K5

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22UCS307-CCV:Java Programming

CO Number	CO Statement	Knowledge Level
CO1	ToremberandunderstandtheOOPsconceptssuchasclass,methods,inheritance,encapsulationand polymorphismetc.	K1,K2
CO2	To understand the differences between application programs andapplets,appletlife cycle andgraphicsprogramming.	K2
CO3	Toimplement programsusingThread,AppletandAWTcontrols, Swings, Beans andServlets	K3
CO4	Toevaluatejavaprogramsusingstreamclassesandfiles.	K4
CO5	TodesignwebpageusingApplets	K5

22UCS308-CC VI: Operating System Concepts and Linux

CO Number	CO Statement	Knowledge Level
CO1	Develop a solid understanding of operating system fundamentals, including process concepts, process states and transitions, operations on processes, interrupt processing, and real storage management strategies	K1
CO2	Understands the use of different process scheduling algorithm and virtual storage techniques	K2
CO3	Apply the concept of Disk Performance Optimization to improve system performance and can be effectively navigate and utilize the Linux environment for various tasks.	K3
CO4	Design, develop, and manage processes and threads, enable to build robust and efficient software systems.	K4
CO5	Evaluate the different methods of interprocess communication and implement secure communication and access control mechanisms in software systems.	K5

22UCS3A1-GE III – Allied III:Computer Based Optimization Techniques

CO Number	COStatement	Knowledge Level
CO1	Rememberandunderstandtheconceptsofrelations	K1,K2
CO2	Understand theconceptoftransportation,networking,replacement,etc.,	K2
CO3	Apply the appropriate optimization techniquesto solve the computerbasedbusinessproblems	K3,K5
CO4	Becomefamiliarwith,LPP,Hungarianmethod,Gametheory,Replacementproblem.	K4,K5
CO5	Analyzetheabilityofcriticalthinking,tofindshortesttimeduration	K5

22UCS3A2-GE III – Allied III: Resource Management Techniques

CO Number	CO Statement	Knowledge Level
CO1	Know the principles and applications of information theory	K1,K2
CO2	To understand sequencing, replacement problems.	K2
CO3	Demonstrate skills to achieve their objective using sequencing models.	K3,K5
CO4	Apply decision making under different business environments.	K4,K5
CO5	Determine a solution to a rectangular game using simplex method	K5

22UCS309-CC Lab III: Programming Lab in Java

CO Number	CO Statement	Knowledge Level
CO1	ToapplythebasicconceptsofJavasuchasclass,methods,constructors,arrays andinterfacestosolvetheproblems.	K3
CO2	Toanalyzeprogramsusingmethodoverloading, methodoverriding,packagesandthreads.	K4
CO3	Tovalidateprogramsusingeventhandling,applets,AWTcontrolsandfiles.	K5

22UCS310-CC Lab IV: Programming Lab in Linux

CO Number	CO Statement	KnowledgeLevel
CO1	To Develop shell scripts for simple applications.	K3,K4,K5
CO2	To Develop programs to create and manage processes.	K3,K4,K5
CO3	To Develop programs for system administration	K3,K4,K5

22UCS3N1-Non-Major Elective Paper-I:PhotoshopLab

CO Number	CO Statement	Knowledge Level
CO1	ToapplythedifferenttypeoftoolsavailableinPhotoshoptocreatesimpleapplications.	K3
CO2	Tointerpretprogramsusingvarious filtersinPhotoshop	K4
CO3	ToIdentifythebasictoolsand componentsofmultimediacomponents.	K5

22UCS3N2-Non-MajorElectivePaper-I:AdvancedApplicationsinMSExcelLab

CO Number	CO Statement	Knowledge Level
CO1	Toapplythedifferenttypeoftoolsavailableinphotoshoptocreatesimpleapplications.	K3
CO2	Tointerpretprogramsusingvarious filtersinPhotoshop	K4
CO5	ToIdentifythebasictoolsand componentsofmultimediacomponents	K5

22UCS411-CC VII:PythonProgramming

CO Number	CO Statement	KnowledgeLevel
CO1	To remember the principles of structured programming andtounderstandbasicsofpython.	K1
CO2	Tounderstandthecommonprogrammingidioms:variables,loop,branch,subroutine andinput/output	K2
CO3	Todeploytheconceptsof functions,standardlibraries,modularprogrammingandthedesignofuserinterfaces	K3
CO4	Tofigureout abilitytoanalyzeandsolvetheproblemsusingadvancedfacilities ofthe PythonLanguage	K4
CO5	Toevaluatetheobjectorientedfeaturesinpythonusingfunctionsand standardlibraries.	K5

22UCS412-CC VIII: Relational Database Management Systems

CO Number	CO Statement	Knowledge Level
CO1	Torememberthebasicconceptsandapplicationsofdatabasesystems andSQL.	K1
CO2	Tounderstandtherelationaldatabasetheory,andbeabletowriterelationalalgebraexpressionsforqueries	K2
CO3	ToapplydesignprinciplesusingtheE-Rmethodandnormalizationapproach	K3
CO4	To interpret SQL interface of a relational DBMS package to create, secure, populate,maintain,andqueryadatabaseandPL/SQLprogrammingusingTriggers andCursors.	K4
CO5	ToattainagoodpracticalskillofmanagingandretrievingofdatausingDataManipulationLanguage(DML)	K5

22UCS413-CCLabV:Programming Lab in Python

CO Number	CO Statement	Knowledge Level
CO1	Toimplement,Interpret,Contrastofvariousoperators.	K3
CO2	Toreviewandanalyzedatabasewithvariables,loop,branch,subroutine,andinput/output.	K4
CO3	Tovalidatehowdatabasesareintegratedwithcomponents,modularprogrammingandthedesignofuserinterfaces.	K5

22UCS414-CC LabVI: ProgrammingLab in RDBMS

CO Number	CO Statement	Knowledge Level
CO1	Toapplythenormalizationtechniquesfordevelopmentofapplicationsoftwaretorealisticproblemsandabilitytoformulatequeriesusing SQL DML/DDL/DCLcommands	K3
CO2	To interpret SQL interface of a relational DBMS package to create, secure, populate,maintain,andqueryadatabaseandPL/SQLprogrammingusingTriggersandCursors.	K4
CO3	ToaccessdatastoredinanOracleRelationalDBMSusingOracleSQL,PL/SQL	K5

22UCS4S1-SEC I: Naan Mudhalvan: Industry 4.0

CO Number	CO Statement	Knowledge Level
CO1	To understand the importance of augmented reality in Industry 4.0 with real-time	K1
CO2	To impart the importance of AI technologies in assistive technology	K2
CO3	To discuss the available applications of AI for promoting early diagnosis of diseases	K3
CO4	To understand the various AI technologies	K4
CO5	To provide Big Data scope into different application areas	K5

22UCS4S2-SEC I: Naan Mudhalvan: Aptitude for Placements

CO Number	CO Statement	Knowledge Level
CO1	To remember the basic mathematics and its functions.	K1
CO2	To understand the various problems in the real world related to shapes, purchase, sales, interest.	K2
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CO4	To analyze the illustration and steps involved in problem solving approach.	K4
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22UCS4N1-Non-MajorElectivePaper-II:Flash Lab

CO Number	COStatement	Knowledge Level
CO1	ToRemembertheconceptsofanimationwithflashSoftware.	K1
CO2	Tounderstandvariousapplications andviewits presentations.	K2
CO3	Toapplythevarioustools available inFlashforcreatinganimations.	K3
CO4	Togettheidea abouttimeline,framesandmotiontweens.	K4
CO5	Tovalidatetheanimationsbyrunningthetestmovies.	K5

22UCS4N2-Non-Majar Elective Paper-II:Internet Applications Lab

CO Number	CO Statement	Knowledge Level
CO1	ToKnowaboutbasicofinternet	K3
CO2	Toanalyzetheconceptthroughonline.	K4
CO3	Togetideaaboutonlineapplications.	K5

22UCS4VA-VAC I: Python for Data Analytics

CO Number	CO Statement	Knowledge Level
CO1	ApplytheconceptofDecisionmakingstatements,loopingconstructs,functionsforsolvingbasicprograms	K3
CO2	AnalyzetheconceptsofLists,tuplesanderrorhandling mechanisms	K4
CO3	Evaluateaprogramincorporatingallthepython language constructs	K5

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23UCS101-CC I: C Programming

CO Number	CO Statement	Knowledge Level
CO1	To keep in mind the fundamentals of C programming	K1
CO2	To understand the loops and decision making statements to solve the problem	K2
CO3	To implement different operations on arrays and use functions to solve the given problem.	K3
CO4	To review the C program that uses pointers, structures and files.	K4
CO5	To understand and evaluate File Concept.	K2,K5

23UCS102-CC II: Digital Computer Fundamentals and Organization

CO Number	CO Statement	Knowledge Level
CO1	To recollect the fundamental concepts and techniques used in digital Electronics.	K1
CO2	To get the idea of basic postulates of Boolean Algebra and to apply the methods of simplifying Boolean expressions	K2
CO3	To apply knowledge about internal circuitry and logic behind any digital system and to design various synchronous and asynchronous circuits.	K3
CO4	To identify the concept of memories, and to introduce microcontroller case study.	K4
CO5	To analyze the usage of different kinds of Memory Management and mapping techniques	K5

23UCS1A1-GE I – Allied I: Mathematics - Statistical Methods & Linear Algebra

CO Number	CO Statement	Knowledge Level
CO1	Understand the statistical formula and apply them in various data analysis	K3
CO2	Understand the concept of most powerful test and analyze the samples based on most powerful test like‘t’ and ‘F’ distributions	K4
CO3	Understand the concepts of probability and apply to solve real life situations	K3
CO4	Recognize the basic concepts of vectors , matrices and linear equations and examine its application in the modern science	K4
CO5	Apply the linear algebra techniques learned from determinants, differential equations to solve simple problems	K3

21UCS1A2-Allied-1: Advanced Mathematics and Applied Statistics

CO	CO Statement	Knowledge Level
CO1	Understand and analyze the statistical formula and apply them in various data analysis problems and Measure and interpret the degree of relationship between variables.	K4,K2
CO2	Apply the distributions to infer the behavior of observation in the sample space and also learn its moment generating function.	K4
CO3	Analyze the concept of most powerful test and analyze the samples based on most powerful test like ‘t‘, ‘F‘ and chi-square.	K4
CO4	Understand the concepts of probability and apply to solve real life situations.	K3,K2
CO5	Evaluate numerical solutions of algebraic equations and compute the integrals by using the appropriate technique.	K5

23UCS103-CC Lab I: Programming Lab in C

CO Number	CO Statement	Knowledge Level
CO1	To implement different operations on arrays and use functions to solve the givenproblems.	K3
CO2	To evaluate the C program that uses pointers, structures and files	K4
CO3	To validate programs with pointers and arrays, perform pointer arithmetic, and use the preprocessor	K5

23UCS204-CC III: Data Structures using C++

CO Number	CO Statement	Knowledge Level
CO1	To keep in mind the key concepts, benefits and applications of object oriented programming	K1,K2
CO2	To get an idea about classes, objects, functions and constructors in C++	K2, K4
CO3	To implement the stacks, queues, singly linked lists and doubly linked lists using C++	K3
CO4	To analyze various searching techniques like sequential search, binary search and Fibonacci search, and sorting techniques like insertion sort, quick sort, merge sort and heap sort	K3
CO5	To evaluate the expressions using prefix, infix and postfix notations	K4

23UCS205-CC IV: Data Communication and Computer Networks

CO Number	CO Statement	Knowledge Level
CO1	Remember the basic concepts of Networks	K1
CO2	Get the idea on Connection-oriented and Connection-less networks	K2
CO3	Apply design principles and functionalities in OSI Reference Layers	K3
CO4	Analyze ISDN network, TCP/IP, etc.,	K4
CO5	Knowledge about different computer networks, reference models and thefunctions of each layer in the models	K5

23UCS2A1-GE II – Allied II: Discrete Mathematics

CO Number	CO Statement	Knowledge Level
CO1	To keep in mind about the fundamental ideas and notation of discrete mathematics withexamples	K1
CO2	To Understand and evaluate the concepts of Relations	K2,K5
CO3	To get the idea of relations and its types and fuzzy sets and its operations	K2
CO4	To analyze the formal language such as formation of words with examples ,groups andmonoids	K4
CO5	To Understand and apply basic properties of graphs and types of graphs, and be able torelate these to practical examples	K2,K3

23UCS2A2-GE II – Allied II: Discrete Mathematical Structures

CO Number	CO Statement	Knowledge Level
CO1	To keep in mind about the fundamental ideas and notation of discrete mathematics with examples	K1
CO2	To get the idea of relations, types of relations and functions, types of functions	K2,K5
CO3	To analyze the formal language such as formation of words and monoids with examples	K2
CO4	To apply algebraic structures	K4
CO5	To Understand some basic properties of graphs, types of graphs, trees and be able to relate these to practical examples	K2,K3

23UCS206-CC Lab II: Programming Lab in Data Structures using C++

CO Number	CO Statement	Knowledge Level
CO1	To apply the data structures such as stacks, queues and trees to solve various computing problems	K3
CO2	To analyze various tree traversals in a binary search tree	K4
CO3	To validate various kinds of searching and sorting techniques	K5

23UCS2S2-SEC I: Naan Mudhalvan : Block chain

CO Number	CO Statement	Knowledge Level
CO1	Remember the basics of Cryptography.	K1
CO2	Understand emerging abstract models for Block chain technology	K2
CO3	Design, build, and deploy a distributed application.	K3
CO4	Analyze the differences between proof-of-work and proof-of-stake consensus.	K4
CO5	Evaluate security, privacy, and efficiency of a Block chain system.	K5

HOD Signature

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