



MANAKULA VINAYAGAR INSTITUTE OF TECHNOLOGY

Kalitheerthalkuppam, Madagadipet, Puducherry - 605 107

B.Tech CSE (IoT and Cyber Security including Block Chain Technology)

REGULATION 2019-20

Code No.	Name of the Subjects
I Semester	
C101	Mathematics – I
C102	Physics
C103	Chemistry
C104	Basic Civil and Mechanical Engineering
C105	Engineering Mechanics
C106	Communicative English
C107	Physics Laboratory
C108	Chemistry Laboratory
C109	Workshop Practice
II Semester	
C110	Mathematics – II
C111	Material Science
C112	Environmental Science
C113	Basic Electrical Electronics and Instrumentation Engineering
C114	Engineering Thermodynamics
C115	Computer Programming
C116	Computer Programming Laboratory
C117	Engineering Graphics
C118	Basic Electrical Electronics and Instrumentation Laboratory
C119	NSS / NCC *
III Semester	
C201	Discrete Mathematics
C202	Digital Circuit and Microprocessor
C203	Data Structures
C204	Oops and Java Programming
C205	Python Programming
C206	Software engineering
C207	Digital Circuit and Microprocessor Lab
C208	Data Structures Lab using Python
C209	Java Programming Lab

IV Semester	
C210	Operating Systems
C211	Computer Networks
C212	Database Management
C213	Design and Analysis of Algorithms
C214	Distributed Computing Systems
C215	Cryptography
C216	Operating Systems Lab
C217	Computer Networks Lab
C218	Database Management Lab
C219	Physical Education *
V Semester	
C301	IoT Architecture and Protocols
C302	Web Technologies
C303	Big data analytics
C304	Blockchain Technologies
C305	Ethical Hacking & Information Security
	Elective-I
C306	IoT Lab
C307	Web Technologies Lab
C308	Big Data analytics lab
C309	General Proficiency – I
VI Semester	
C310	Smart Contracts and Application Development
C311	Cloud Computing and Virtualization
C312	Cyber and Digital Forensics
C313	Fog and Edge Computing
	Elective-II
C314	Smart Contracts and Application Development Lab
C315	Cloud Computing Lab
C316	Cyber Security Lab
C317	General Proficiency – II
VII Semester	
C401	Professional Ethics & Human Values
C402	Wireless communication networks
C403	Network Security
	Elective-III
	Elective-IV
C404	Wireless communication lab
C405	Network security Lab
C406	Technical Seminar and report writing
C407	Industrial Visit/Training
C408	Project Work-I

VIII Semester	
C409	Cyber Laws and Security Policies
C410	Energy Harvesting And Power Management for IoT
	Elective-V
	Elective-VI
C411	Comprehensive Viva
C412	Project Work-II

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COURSE OUTCOMES

I SEMESTER

Course Name: C101		MATHEMATICS – I	YEAR/SEM: I/I
Course Outcome No	Course Outcomes		
C101.1	Learn the evaluation policy of Curvature, evolutes and some special functions like Gamma & Beta function.		
C101.2	Apply partial derivatives to find maxima and minima.		
C101.3	Able to evaluate double integrals and triple integrals, which are used to evaluate area and volume of defined and undefined shapes.		
C101.4	Gain the knowledge to solve first order differential equation arising in Engineering Field.		
C101.5	Gain the knowledge to solve higher order differential equation and able to form mathematical & physical interpretation of its solution.		

Course Name: C102		PHYSICS	YEAR/SEM: I/I
Course Outcome No	Course Outcomes		
C102.1	Understand the concepts of ultrasonic production, detection applications and acoustical properties of buildings.		
C102.2	Learn the light properties like interference, diffraction and polarization and study their parameters like resolving power, dispersive power of optical devices.		
C102.3	Understand the basic operating principles of laser, its applications, optical fiber, and its types, transmission characteristics, applications of optical fibers.		
C102.4	Study the wave mechanics concepts through wave equations and applying the knowledge of barrier penetration problem in designing electronic devices like tunnel diode.		
C102.5	Understand nuclear properties, power production through reactors and gain knowledge of fusion reactors which is under research.		

Course Name: C103		CHEMISTRY	YEAR/SEM: I/I
Course Outcome No	Course Outcomes		
C103.1	To impart the students in-depth in the discipline of water technology and develop innovative methods to produce soft water for industrial use and potable water at cheaper cost.		
C103.2	Fundamentals and formation of polymers with its properties and engineering applications of polymers such as conducting polymers can be understood		
C103.3	Students are able to illustrate the practical importance of electrochemistry for solving challenges and design of batteries.		
C103.4	This unit implicit the concept of corrosion and insist the students to apply their knowledge for protection of different metals from corrosion.		
C103.5	Guide the students to gain the knowledge about the cooling curves, phase diagrams, alloys and their practical importance.		

Course Name: C104		BASIC CIVIL AND MECHANICAL ENGINEERING	YEAR/SEM: I/I
Course Outcome No	Course Outcomes		
C104.1	Understand the building classification as per National building code.		
C104.2	Get the idea about construction procedure for various components of the building.		
C104.3	Students understand the principles of surveying, construction procedure for roads, bridges and dams.		
C104.4	Student will be able know about the working of Internal and external combustion systems.		
C104.5	Student will be able know about Non-Conventional Energy Systems.		

Course Name: C105		ENGINEERING MECHANICS	YEAR/SEM: I/I
Course Outcome No	Course Outcomes		
C105.1	Understand the basic laws of mechanics and resolution of forces using different methods.		
C105.2	Learn and apply the knowledge on analysis of forces acting on the trusses and effect of friction force on bodies.		
C105.3	Learn about the centroid and moment of inertia for plane and solid figures.		
C105.4	Understand the three laws of motion, principles of dynamics for particles.		
C105.5	The student will able to analyze the laws of motion for rigid bodies.		

Course Name: C106		COMMUNICATIVE ENGLISH	YEAR/SEM: I/I
Course Outcome No	Course Outcomes		
C106.1	Understand the basic concepts of communication. The student also understands the importance of listening.		
C106.2	Understands the comprehension, identifies the difference between Skimming and scanning, guess the meaning of the words, identify to make notes.		
C106.3	Students learnt the writing skills, how to write a paragraph in a proper manner, four modes of writing and how to make bibliographical entries		
C106.4	Students learnt about the types of letters, report writing, notices and memo and also developed their skill in writing		
C106.5	Students will be able to develop their spoken skills by making them to involve in many activities related to it.		

Course Name:C107		PHYISCS LABORATORY	YEAR/SEM: I/I
Course Outcome No	Course Outcomes		
C107.1	State various laws which they have studied through experiments		
C107.2	Describe principles of optical fibre communication		
C107.3	Develop skills to impart practical knowledge in real time solutions		
C107.4	Understand principle, concept, working and applications of new technology and comparison of results with theoretical calculations		
C107.5	Understand measurement technology, usage of new instruments and applications in engineering studies		

Course Name: C108		CHEMISTRY LABORATORY	YEAR/SEM: I/I
Course Outcome No	Course Outcomes		
C108.1	Students will become well acquainted to test amount of hardness present in sample of water for their engineering needs		
C108.2	Students will be efficient in estimating acidity/alkalinity in given samples		
C108.3	Students will have knowledge about estimating amount of dissolved oxygen in water		
C108.4	Students will become well acquainted to estimate copper in brass		
C108.5	Students will have knowledge about determination of viscosity of sucrose using Ostwald's viscometer		

Course Name: C109		WORKSHOP PRACTICE LABORATORY	YEAR/SEM: II/I
Course Outcome No	Course Outcomes		
C109.1	To convey the basics of mechanical tools used in carpentry section and establish hands on experience in making the different carpentry joints		
C109.2	To gain knowledge on types of tools and machines used in sheet metal shop and perform some exercises		
C109.3	To develop basic welding and fitting joints using the hand tools and establish the importance of joints and fitting in engineering applications		
C109.4	To gain knowledge of the different machines used in manufacturing processes which are commonly employed in the industry, to fabricate components using different materials		
C109.5	To carry out simple manufacturing operations in lathe, drilling and shaping machine		

II SEMESTER

Course Name: C110		MATHEMATICS – II	YEAR/SEM: I/II
Course Outcome No	Course Outcomes		
C110.1	Find the Eigen values and Eigen vectors of a matrix and use Cayley-Hamilton Theorem for finding the inverse of a matrix.		
C110.2	Understand the statements of Stoke's Theorem and Gauss Divergence Theorem and be aware of applications of these theorems in Engineering Field		
C110.3	Compute the Laplace Transform of a Continuous function and familiar with its basic properties, including the initial and final value theorems.		
C110.4	Compute the Inverse Laplace Transform and solving integral equations and differential equation with initial conditions.		
C110.5	Determine the Fourier Transform, Fourier Cosine and Sine Transform of elementary functions, properties of transforms and its applications in engineering		

Course Name: C111		MATERIAL SCIENCE	YEAR/SEM: I/II
Course Outcome No	Course Outcomes		
C111.1	Understand the crystal lattice and its structure of crystal planes ,directions and to designate the miller indices of the cubic crystal .Applying the knowledge of x-ray diffraction to analyze defects in the various crystalline solids		
C111.2	To learn about the effect of polarization in dielectric material and to explain the dielectric material suitable for different application.		
C111.3	The outcome of third unit makes the student to understand about different magnetic materials and to apply the basic idea of magnetism and to know about the application of magnetic storage devices.		
C111.4	Understand about advanced materials and convention materials applying the knowledge to synthesis and characterize the various nano materials to known their physical and chemical properties to meet out the demands for industrial application in the new era of engineering		
C111.5	To understand the importance of material science as a subject that revolutionized modern day technologies and revolutionized modern day technologies which lead to the development of new materials and devices for all branches of engineering		

Course Name: C112		ENVIRONMENTAL SCIENCE	YEAR/SEM: I/II
Course Outcome No	Course Outcomes		
C112.1	Basic Knowledge to understand what constitutes the environment, Knowledge of knowing the precious resources in the environment and the role of human being in maintaining a clean environment.		
C112.2	Knowledge of knowing how to maintain ecological balance and preserve biodiversity.		
C112.3	Knowledge of solving and minimizing global warming and pollution control.		
C112.4	Knowledge of solving and minimizing water, land, thermal and radioactive pollution control.		
C112.5	Developed skills in procedures and instrumental methods applied in analytical tasks of environmental chemistry.		

Course Name: C113		BASIC ELECTRICAL AND ELECTRONICS ENGINEERING	YEAR/SEM: I/II
Course Outcome No	Course Outcomes		
C113.1	Gain basic knowledge of DC circuits		
C113.2	Acquire knowledge about the single phase and three base electrical circuits		
C113.3	Gain knowledge on operating principles of rotating machines and awareness of general structure of power systems.		
C113.4	Understand the basic operation, functions and applications of PN junction diode, transistor and oscillators.		
C113.5	Acquire knowledge on logic gates, flip flops, shift registers and counters.		

Course Name: C114		ENGINEERING THERMODYNAMICS	YEAR/SEM: I/II
Course Outcome No	Course Outcomes		
C114.1	Ability to understand the basic concepts of thermodynamic such as temperature, pressure, system, properties, process, state, cycles and equilibrium.		
C114.2	Ability to apply the first Law of Thermodynamics on closed and control volume systems.		
C114.3	Ability to apply Second Law of Thermodynamics and entropy concepts in analyzing the thermal efficiencies of heat engines and the coefficients of performance for refrigerators.		
C114.4	Students would understand air standard cycle analysis such as the Otto cycle, diesel, bray ton and dual cycles.		
C114.5	To explain the role of refrigeration cycles & systems.		

Course Name: C115		COMPUTER PROGRAMMING	YEAR/SEM: I/II
Course Outcome No	Course Outcomes		
C115.1	Have a deeper knowledge on the evolution of computers, components and its applications, have an awareness of internet, network structures, word processing and worksheets.		
C115.2	Know about various problem solving techniques, program development cycle, basics tokens of C program and its structure.		
C115.3	Learn about various control statements, declaration and initialization of arrays, functions, storage classes and string functions.		
C115.4	Became familiar on structure, pointers and its manipulation.		
C115.5	Know about Preprocessors, command line arguments and various file operations.		

Course Name: C116		COMPUTER PROGRAMMING LABORATORY	YEAR/SEM: I/II
Course Outcome No	Course Outcomes		
C116.1	Understood the program editing and compilation environment		
C116.2	Able to write simple C programs using most frequently used control structures		
C116.3	Apply the methods problems using arrays and functions		
C116.4	Learnt to handle data processing using structures for simple applications		
C116.5	Write programs that could handle file I/O and pointers		

Course Name: C117		ENGINEERING GRAPHICS	YEAR/SEM: I/II
Course Outcome No	Course Outcomes		
C117.1	Use the drawing instruments effectively and able to dimension the given figures		
C117.2	Appreciate the usage of engineering curves in tracing the paths of simple machine components		
C117.3	Understand the concept of projection and acquire visualization skills, projection of points		
C117.4	Able to draw the basic views related to projections of Lines, Planes		
C117.5	Draw projections and solids and development of surfaces		

Course Name: C118 BASIC ELECTRICAL ELECTRONICS AND INSTRUMENTATION LABORATORY

YEAR/SEM: I/II

Course Outcome No	Course Outcomes
C118.1	Acquire knowledge about the single phase and three base electrical circuits
C118.2	Gain knowledge on operating principles of rotating machines and general structure of power systems
C118.3	Understand the basic operation and applications of PN junction diode, transistor and oscillators
C118.4	Acquire knowledge on logic gates, flip flops, shift registers and counters
C118.5	Gain knowledge on various communication systems and network models and the use of ISDN

III SEMESTER

Course Name: C201		DISCRETE MATHEMATICS	YEAR/SEM: II/III
Course Outcome No	Course Outcomes		
C201.1	Have knowledge of the concepts needed to test the logic of a program		
C201.2	Have an understanding in identifying structures on many levels.		
C201.3	Be aware of a class of functions which transform a finite set into another finite set which relates to input and output functions in computer science.		
C201.4	Be aware of the counting principles.		
C201.5	Be exposed to concepts and properties of algebraic structures such as groups, rings and fields		

Course Name: C202		DIGITAL CIRCUIT AND MICROPROCESSOR	YEAR/SEM: II/III
Course Outcome No	Course Outcomes		
C202.1	Test the Digital Systems, Logic Families and logic gates and construct combinational logical circuit and sequential logical circuit		
C202.2	Understand working multiplexer and de multiplexer concepts		
C202.3	Understand the working components of the microprocessors		
C203.4	Develop assembly language programs, I/O interfacing using 8085		
C203.5	Develop assembly language programs, I/O interfacing using 8086		

Course Name: C203		DATA STRUCTURES	YEAR/SEM: II/III
Course Outcome No	Course Outcomes		
C203.1	Selection of relevant data structures and combinations of relevant data structures for the given problems in terms of memory and run time efficiency		
C203.2	Apply data abstraction in solving programming problems		
C203.3	Apply Graph theoretical approaches for solving real-life problems		
C203.4	To identify and appropriate data structure for given problem		
C203.5	To design and analyze time and space efficiency of data Structure		

Course Name: C204		OOPS AND JAVA PROGRAMMING	YEAR/SEM: II/III
Course Outcome No	Course Outcomes		
C204.1	Conceptualize the problem in terms of object oriented features.		
C204.2	Design multi-threaded programs to simulate parallel execution.		
C204.3	Design and develop real time applications using basic GUI components with event handling mechanism.		
C204.4	Design generic programs and develop database oriented applications.		
C204.5	Simulate client server applications -Design and develop a complete object oriented application		

Course Name: C205		PYTHON PROGRAMMING	YEAR/SEM: II/III
Course Outcome No	Course Outcomes		
C205.1	Under the basic concepts of Python Programming		
C205.2	Develop algorithmic solutions to simple computational problems		
C205.3	Structure simple Python programs for solving problems		
C205.4	Represent compound data using Python lists, tuples, dictionaries		
C205.5	Develop applications using file and exception handling concepts		

Course Name: C206		SOFTWARE ENGINEERING	YEAR/SEM: II/III
Course Outcome No	Course Outcomes		
C206.1	Ability to apply basic knowledge and understanding of the analysis, synthesis and design of complex systems		
C206.2	Develop, maintain and evaluate large-scale software systems		
C206.3	Produce efficient, reliable, robust and cost-effective software solutions		
C206.4	Able to develop Software testing tool		
C206.5	Evaluate project by using project management and requirements analysis		

Course Name: C207 DIGITAL CIRCUIT AND MICROPROCESSOR LABORATORY		YEAR/SEM: II/III
Course Outcome No	Course Outcomes	
C207.1	Learn the basics of gates	
C207.2	Construct basic combinational circuits and verify their functionalities	
C207.3	Apply the design procedures to design basic sequential circuit	
C207.4	Ability to handle logical operations using assembly language programming	
C207.5	Ability to handle string instructions using assembly language programming	

Course Name: C208		DATA STRUCTURES LAB USING PYTHON	YEAR/SEM: II/III
Course Outcome No	Course Outcomes		
C208.1	Select appropriate data structures as applied to specified problem definition		
C208.2	Implement operations like searching, insertion, and deletion, traversing mechanism etc. on various data structures		
C208.3	Implement appropriate sorting/searching technique for given problem		
C208.4	Design advance data structure using Non-Linear data structure		
C208.5	Determine and analyze the complexity of given Algorithm		

Course Name: C209		JAVA PROGRAMMING LABORATORY	YEAR/SEM: II/III
Course Outcome No	Course Outcomes		
C209.1	Use the syntax and semantics of java programming language and basic concepts of OOP		
C209.2	Develop reusable programs using the concepts of inheritance, polymorphism, interfaces and packages.		
C209.3	Apply the concepts of Multithreading and Exception handling to develop efficient and error free codes.		
C209.4	Design event driven GUI and web related applications which mimic the real word scenarios.		
C209.5	To solving real world problems using java collection frame work		

IV SEMESTER

Course Name: C210		OPERATING SYSTEMS	YEAR/SEM: II/IV
Course Outcome No	Course Outcomes		
C210.1	To understand the basic concepts and functions of Operating Systems		
C210.2	To know various threading models, process synchronization and deadlocks		
C210.3	Analyze the performance of various CPU scheduling algorithms (Analyze)		
C210.4	Discuss various memory management schemes		
C210.5	Knowledge about administrative tasks on Linux servers and distinguish iOS and Android OS		

Course Name: C211		COMPUTER NETWORKS	YEAR/SEM: II/IV
Course Outcome No	Course Outcomes		
C211.1	Recognize the technological trends of Computer Networking		
C211.2	Analyze data link layer and its applications		
C211.3	Evaluate network layer and the protocols used		
C211.4	Analyze transport layer protocols and congestion control		
C211.5	Program network communication services for client/server and other application layouts		

Course Name: C212		DATABASE MANAGEMENT	YEAR/SEM: II/IV
Course Outcome No	Course Outcomes		
C212 .1	Classify modern and futuristic database applications based on size and complexity		
C212 .2	Design a database from an Universe of Discourse, using ER diagrams		
C212 .3	Map ER model into Relations and to normalize the relations		
C212 .4	Create a physical database from a design using DDL statements with appropriate key, domain and referential integrity constraints		
C212 .5	Analyze different ways of writing a query and justify which is the effective and efficient way		

Course Name: C213 DESIGN AND ANALYSIS OF ALGORITHMS		YEAR/SEM: II/IV
Course Outcome No	Course Outcomes	
C213.1	Selection of relevant algorithm technique and combinations of relevant data structures for the given problems in terms of memory and run time efficiency.	
C213.2	Apply data abstraction in solving programming problems	
C213.3	Capable of categorizing the given problem into NP-Hard or NP-Complete	
C213.4	Able to Argue the correctness of algorithms using inductive proofs and Analyze worst-case running times of algorithms using asymptotic analysis.	
C213.5	Able to Compare between different data structures and pick an appropriate data structure for a design situation..	

Course Name: C214 DISTRIBUTED COMPUTING SYSTEMS		YEAR/SEM: II/IV
Course Outcome No	Course Outcomes	
C214.1	To learn the characteristics of a distributed system along with its and design challenges	
C214.2	Illustrate the mechanism of communication between distributed objects	
C214.3	Describe the distributed file service architecture and the important characteristics of file systems.	
C214.4	Discuss concurrency control algorithms applied in distributed transactions	
C214.5	create an awareness of the fundamental technical challenges in advanced distributed systems design and implementation	

Course Name: C215 CRYPTOGRAPHY		YEAR/SEM: II/IV
Course Outcome No	Course Outcomes	
C215.1	The course shall be able to account for the cryptographic theories, principles and techniques that are used to establish security properties	
C215.2	Analyze and use methods for cryptography, and reflect about limits and applicability of methods	
C215.3	Understand most common type of cryptographic algorithm	
C215.4	Understand the public key infrastructure	
C215.5	Understand security protocols for protecting data on networks	

Course Name: C216		OPERATING SYSTEMS LABORATORY	YEAR/SEM: II/IV
Course Outcome No	Course Outcomes		
C216.1	Exposure to different OS.		
C216.2	Awareness of concepts of multiprogramming, multithreading and multitasking		
C216.3	Demonstration of memory management algorithms		
C216.4	Demonstration of file-handling concepts by implementing suitable algorithms		
C216.5	Awareness of computational issues, resources in distributed environment		

Course Name: C217		COMPUTER NETWORKS LABORATORY	YEAR/SEM: II/IV
Course Outcome No	Course Outcomes		
C217.1	Understand the basics of data communication, networking, internet and their importance		
C217.2	Analyze the services and features of various protocol layers in data networks		
C217.3	Differentiate wired and wireless computer networks		
C217.4	Analyze TCP/IP and their protocols		
C217.5	Recognize the different internet devices and their functions		

Course Name: C218		DATABASE MANAGEMENT LABORATORY	YEAR/SEM: II/IV
Course Outcome No	Course Outcomes		
C218.1	Basic concepts of Database Systems and Application		
C218.2	Use the basics of SQL and construct queries using SQL in database creation and interaction		
C218.3	Design a commercial relational database system (Oracle, MySQL) by writing SQL using the system		
C218.4	Analyze and Select storage and recovery techniques of database system Recognize the different internet devices and their functions		
C218.5	Develop solutions using database concepts for real time requirements		

V SEMESTER

Course Name: C301 IOT ARCHITECTURE AND PROTOCOLS		YEAR/SEM: III/V
Course Outcome No	Course Outcomes	
C301.1	Ability to apply basic knowledge and understanding of Architecture and protocols.	
C301.2	Gain knowledge in network IEEE standards.	
C301.3	Understand the concepts of IoT Architecture Reference model and IoT reference architecture	
C301.4	Analyze various IoT Application layer Protocols.	
C301.5	Apply IP based protocols and Authentication Protocols for IoT	

Course Name: C302 WEB TECHNOLOGIES		YEAR/SEM: III/V
Course Outcome No	Course Outcomes	
C302.1	Understand major components and protocols of internet application	
C302.2	Ability to design and develop client side scripting techniques	
C302.3	Ability to build real world applications using client and server side scripting languages	
C302.4	Able to develop Applications using PHP	
C302.5	Design and develop web applications with database connectivity	

Course Name: C303 BIG DATA ANALYTICS		YEAR/SEM: III/V
Course Outcome No	Course Outcomes	
C303.1	Understand the key issues in big data management and its associated applications in intelligent business and scientific computing.	
C303.2	Acquire fundamental enabling techniques and scalable algorithms like Hadoop, Map Reduce and NO SQL in big data analytics.	
C303.3	Interpret business models and scientific computing paradigms, and apply software tools for big data analytics.	
C303.4	Achieve adequate perspectives of big data analytics in various applications like recommender systems, social media applications etc.	
C303.5	Design of Algorithms to solve Data Intensive Problems using Map Reduce Paradigm	

Course Name: C304 BLOCKCHAIN TECHNOLOGIES		YEAR/SEM: III/V
Course Outcome No	Course Outcomes	
C304.1	Understand emerging abstract models for Block chain Technology	
C304.2	Analyse the concept of bit coin and mathematical background behind it	
C304.3	Apply the tools for understanding the background of crypto currencies	
C304.4	Identify major research challenges and technical gaps existing between theory and practice in crypto currency domain	
C304.5	Understanding of latest advances and its applications in Block Chain Technology.	

Course Name: C305 ETHICAL HACKING & INFORMATION SECURITY		YEAR/SEM: III/V
Course Outcome No	Course Outcomes	
C305.1	To master information security governance, and related legal and regulatory issues	
C305.2	Learn various hacking methods and perform system security vulnerability testing	
C305.3	Perform system vulnerability exploit attacks	
C305.4	Learn various issues related to hacking.	
C305.5	Illustrate the importance of ethical hacking	

Course Name: C306 IoT LABORATORY		YEAR/SEM: III/V
Course Outcome No	Course Outcomes	
C306.1	Understand the concept of Internet of Things	
C306.2	Implement interfacing of various sensors with Arduino/Raspberry Pi	
C306.3	Demonstrate the ability to transmit data wirelessly between different devices	
C306.4	Show an ability to upload/download sensor data on cloud and server.	
C306.5	Examine various SQL queries from MySQL database	

Course Name: C307		WEB TECHNOLOGIES LABORATORY	YEAR/SEM: III/V
Course Outcome No	Course Outcomes		
C307.1	List various tags in html and use these, apply Cascaded style sheet to create web page		
C307.2	Design and Explain the basic concept of XML and Create XML documents and Schema.		
C307.3	Compare Servlet and JSP concepts and apply JSP concepts to create dynamic web Pages by reducing the code complexity and store data in database.		
C307.4	Explain usage of web servers and use this to develop webpage and store data in database in JSP on Web server.		
C307.5	Develop solution to complex problems using appropriate method, technologies, framework, web services and content management.		

Course Name: C308		BIG DATA ANALYTICS LAB	YEAR/SEM: III/V
Course Outcome No	Course Outcomes		
C308.1	Identify Big Data and its Business Implications		
C308.2	List the components of Hadoop and Hadoop Eco-System		
C308.3	Access and Process Data on Distributed File System		
C308.4	Manage Job Execution in Hadoop Environment		
C308.5	Develop Big Data Solutions using Hadoop Eco System		

VI SEMESTER

Course Name: C310		SMART CONTRACTS AND APPLICATION DEVELOPMENT	YEAR/SEM: III/VI
Course Outcome No	Course Outcomes		
C310.1	Basic concepts of Smart Contracts.		
C310.2	Recognize different Smart Contracts" programming languages and their execution environments.		
C310.3	Identify the key features of different Smart Contracts" programming languages.		
C310.4	Implement Smart Contracts in Ethereum using Solidity.		
C310.5	identify and resolve security issues/problems with smart contracts and be able to demonstrate the correctness of the resulting smart contract		

Course Name: C311		CLOUD COMPUTING AND VIRTUALIZATION	YEAR/SEM: III/VI
Course Outcome No	Course Outcomes		
C311.1	Employ the concepts of storage virtualization, network virtualization and its management		
C311.2	Apply the concept of virtualization in the cloud computing		
C311.3	Identify the architecture, infrastructure and delivery models of cloud computing		
C311.4	Develop services using Cloud computing.		
C311.5	Apply the security models in the cloud environment		

Course Name: C312		CYBER AND DIGITAL FORENSICS	YEAR/SEM: III/VI
Course Outcome No	Course Outcomes		
C312.1	Will gain the knowledge to implement various security attacks.		
C312.2	Will get the ideas in various ways to trace an attacker.		
C312.3	Will get the practical exposure to forensic tools		
C312.4	Perform recovery of digital evidence from various digital devices using a variety of software utilities		
C312.5	To conduct a digital forensics investigation, including the concept of the chain of evidence		

Course Name: C313		FOG AND EDGE COMPUTING	YEAR/SEM: III/VI
Course Outcome No	Course Outcomes		
C313.1	Understand the use of IoT architecture with its entities and protocols via edge and fog, up to the cloud.		
C313.2	Get familiar on security & privacy issues related to area of fog & edge computing, IoT, and big data.		
C313.3	Exploit fog and edge computing in implementing real time applications		
C313.4	Design and develop simulation scenarios for Edge and Fog Computing using network simulator.		
C313.5	Explore research, frameworks, applications in edge and fog computing.		

Course Name: C314		SMART CONTRACTS AND APPLICATION DEVELOPMENT LAB	YEAR/SEM: III/VI
Course Outcome No	Course Outcomes		
C314.1	Develop mobile applications using GUI and Layouts.		
C314.2	Develop an applications using Event Listener.		
C314.3	Develop an application using Databases.		
C314.4	Develop an applications using RSS Feed, Internal/External Storage, SMS, Multi-threading and GPS.		
C314.5	Analyze and discover own app for simple needs.		

Course Name: C315		CLOUD COMPUTING LAB	YEAR/SEM: III/VI
Course Outcome No	Course Outcomes		
C315.1	Configure various virtualization tools such as Virtual Box, VMware workstation.		
C315.2	Design and deploy a web application in a PaaS environment.		
C315.3	Learn how to simulate a cloud environment to implement new schedulers.		
C315.4	Install and use a generic cloud environment that can be used as a private cloud.		
C315.5	Manipulate large data sets in a parallel environment.		

Course Name: C316

CYBER SECURITY LAB

YEAR/SEM: III/VI

Course Outcome No	Course Outcomes
C316.1	Implement the cipher techniques
C316.2	Develop the various security
C316.3	Use different open source tools for network security and analysis
C316.4	Develop a signature scheme using Digital signature standard.
C316.5	Demonstrate the network security system using open source tools

VII SEMESTER

Course Name: C401 PROFESSIONAL ETHICS & HUMAN VALUES YEAR/SEM: IV/VII	
Course Outcome No	Course Outcomes
C401.1	The student should be able to apply ethics in society,
C401.2	Students discuss the ethical issues related to engineering
C401.3	Students able to realize the responsibilities and rights in the society.
C401.4	Identify ethical concerns in research and intellectual contexts, including academic integrity, use and citation of sources, the objective presentation of data, and the treatment of human
C401.5	subjects CO6 Demonstrate knowledge of ethical values in non-classroom activities, such as service learning, internships, and field work integrate, synthesize, and apply knowledge of ethical dilemmas and resolutions in academic settings, including focused and interdisciplinary research

Course Name: C402 WIRELESS COMMUNICATION NETWORKS YEAR/SEM: IV/VII	
Course Outcome No	Course Outcomes
C402.1	Recognize the technological trends of wireless sensor networks
C402.2	Evaluate the challenges in building wireless sensor networks and solutions to those
C402.3	Analyze and deploy application specific Wireless Sensor Network through available technologies
C402.4	The student would be able to identify suitable signaling and power allocation and optimization techniques for the wireless systems
C402.5	The student would be capable of exploiting multiple antenna techniques for capacity/ performance gains and explore other research areas in 5G.

Course Name: CS403 NETWORK SECURITY YEAR/SEM: IV/VII	
Course Outcome No	Course Outcomes
C403.1	To Analyze the number theory used for network security
C403.2	Analyze the design concept of internet security and authentication
C403.3	Can be able to develop experiments on algorithm used for security
C403.4	The student would have ability to develop new authentication and key management techniques
C403.5	The student would have ability to develop a new network security protocols


Course Name: CS404 WIRELESS COMMUNICATION LAB		YEAR/SEM: IV/VII
Course Outcome No	Course Outcomes	
C404.1	Evaluate the impact of different propagation conditions in estimation of received signal power.	
C404.2	Configure different wireless communication systems and evaluate their functioning.	
C404.3	Establishing LTE and MIMO system for two way communication.	
C404.4	Find geographical position using survey plotting with the help of GPS system	
C404.5	Design micro strip patch antenna using suitable parameters	

Course Name: CS405 NETWORK SECURITY LAB		YEAR/SEM: IV/VII
Course Outcome No	Course Outcomes	
C405.1	Develop code for classical Encryption Techniques to solve the problems.	
C405.2	Build cryptosystems by applying symmetric and public key encryption algorithms.	
C405.3	Construct code for authentication algorithms.	
C405.4	Develop a signature scheme using Digital signature standard.	
C405.5	Demonstrate the network security system using open source tools	

VIII SEMESTER

Course Name: C409 CYBER LAWS AND SECURITY POLICIES		YEAR/SEM: IV/VIII
Course Outcome No	Course Outcomes	
C409.1	The students will understand the importance of professional practice, Law and Ethics in their personal lives and professional careers.	
C409.2	The students will learn the rights and responsibilities as an employee, team member and a global citizen	
C409.3	Develop the understanding of relationship between commerce and cyberspace	
C409.4	The students in depth knowledge of information technology act and legal frame work of right to privacy, data security and data protection.	
C409.5	Make Study On Various Case Studies On Real Time Crimes.	

Course Name: C410 ENERGY HARVESTING AND POWER MANAGEMENT FOR IOT		YEAR/SEM: IV/VIII
Course Outcome No	Course Outcomes	
C410.1	The students able to design IoT-based systems for real-world problems.	
C410.2	The Students understands the role of power management in a successful IoT deployment.	
C410.3	To manage power efficiently for remote devices and long-lived devices.	
C410.4	The student understands the role of Energy harvesting wireless sensors and power generation	
C410.5	Make study on Applications of energy harvesting systems and its case studies	


 23/3/22
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