ARUNAI ENGINEERING COLLEGE
Velu Nagar, Thenmathur, Tiruvannamalai - 606603.
(Approved by AICTE, Affiliated by Anna University
Chennai)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
REGULATION-2017
Course Outcomes

Semester - I	
Course code and Name	**Course Outcomes(CO)** **After completion of the course, the students will be able to**
C101-HS8151 Communicative English	**C101.1:** Communicate clearly both in the written form and orally using appropriate vocabulary and comprehend written texts to make inferences. **C101.2:** Speak persuasively in different social contexts and write biographical details and technical documents cohesively, coherently and flawlessly using appropriate words. **C101.3:** Speak, read and write effectively for a variety of professional and social settings. **C101.4:** Read descriptive, narrative, expository and interpretive texts and write using creative, critical, analytical and evaluative methods. **C101.5:** Listen, comprehend and respond to different spoken and written discourses/excerpts in different accents and write different genres of texts adopting various writing strategies.
C102-MA8151 Engineering Mathematics - I	**C102.1:** Use both the limit definition and rules of differentiation to differentiate functions. **C102.2:** Apply differentiation to solve maxima and minima problems. **C102.3:** Evaluate integrals both by using Riemann sums and by using the Fundamental Theorem of Calculus, also evaluate integrals using techniques of integration, such as substitution, partial fractions and integration by parts, in addition to determine convergence/divergence of improper integrals and evaluate convergent improper integrals. **C102.4:** Apply integration to compute multiple integrals, area, volume, integrals in polar coordinates, in addition to change of order and change of variables. **C102.5:** Apply various techniques in solving differential equations.

C103-PH8151 EngineeringPhysics	**C103.1:** Students interpret the fundamental knowledge about the elastic nature of materials and be able to choose the materials depending upon the modulus of elasticity for different applications. **C103.2:** Identify and appreciate the advantages of optical communication using LASER **C103.3:** Students understand thermal conducting properties of solids and liquids and differentiate a good thermal conductor from the bad thermal conductor. **C103.4:** Apply the knowledge of quantum mechanics and classical mechanics in addressing the problems related to science and technology. **C103.5:** Students extend the knowledge about the crystal structures, crystal defects and crystal growth.
C104-CY8151 Engineering Chemistry	**C104.1:** Comprehend the importance of water technology in the purification of water and its domestic and industrial applications. **C104.2:** Understand the concept of absorption in surface chemistry and catalysis and its applications. **C104.3:** Make use of the phase rule in identifying its application in metallurgy and manufacture of alloys. **C104.4:** Learn the different types of industrial techniques of petroleum processing and the determination of caloric values and combustion parameters. **C104.5:** Empathize the fundamentals of different alternative source of energy, the generation process and batteries.
C105-GE8151 Problem Solving and Python Programming	**C105.1:** Develop algorithmic solutionsto simple computationalproblems. **C105.2:** Read, write and execute simple python programs. **C105.3:** Apply control, looping structures and functions to solve problems. **C105.4:** Represent compound data using python lists, tuples, and dictionaries. **C105.5:** Read and Write data from/to files in python programs.
C106-GE8152 EngineeringGraphics	**C106.1:** Familiarize with the fundamentals and standards of Engineeringgraphics **C106.2:** Perform freehand sketching of basic geometrical constructions and multiple views of objects. **C106.3:** Project orthographic projections of lines and plane surfaces. **C106.4:** Draw projections and section of solids and development Of surfaces.

	C106.5: Visualize and to project isometric and perspective sections of simple solids.
C107-GE8161 Problem Solving and Python Programming Laboratory	**C107.1:** Write, test, and debug simple Python programs. **C107.2:** Implement Python programs with conditionals and loops. **C107.3:** Develop Python programs step-wise by defining functions and calling them. **C107.4:** Demonstrate the use Python lists, tuples, and dictionaries forrepresenting compound data. **C107.5:** Illustrate the concepts of read and write data from/to files in Python.
C108-BS8161 Physics and Chemistry Laboratory	**C108.1:** The students will have the ability to test materials by using their knowledge of applied physics principles in optics and properties of matter. **C108.2:** Gain hands-on knowledge in the quantitative chemical analysis of chloride, dissolved oxygen, hardness, and alkalinit y and copper ions by titration methods. **C108.3:** Understand basic concept in the determination of acids, sodium, potassium and iron by the instrumental methods of analysis.
Semester – II	
C111-HS8251 TechnicalEnglish	**C111.1:** Read technical texts and write area specific texts effortlessly. **C111.2:** Listen and comprehend lectures and talks in their areas of specialization and write effectively for a variety of professional and social settings. **C111.3:** Speak and write appropriately and effectively in varied formal and informal contexts. **C111.4:** Write effectively and persuasively and produce different types of writing such as letters, minutes, reports and winning job applications. **C111.5:** Communicate clearly using technical vocabulary in their professional correspondences.
C112-MA8251 Engineering Mathematics - II	**C112.1:** Eigenvalues and eigenvectors, diagonalization of a matrix. Symmetric matrices, Positive definite matrices and similar matrices. **C112.2:** Gradient, divergence and curl of a vector point function and related identities, Evaluation of line, surface and volume integrals using Gauss, Stokes and Green's theorems and their verification. **C112.3:** Analytic functions and conformal mapping Complex integration.

	C112.4: Laplace transform and inverse transform of simple functions, properties, various related theorems and application to differential equations with constant coefficients
C113-PH8252 Physics for Information Science	**C113.1:** Extend the knowledge about the conducting materials and theirproperties. **C113.2:** Interpret the fundamental knowledge about the semiconductorsand able to differentiate various types of semiconductors. **C113.3:** Apply the knowledge of magnetic materials and principles indata storage. **C113.4:** Identify and appreciate the functioning and applications of optical materials. **C113.5:** Utilize the knowledge about the quantum structures and nanomaterials in various applications.
C114-BE8255 Basic Electrical and Electronics and Measurement Engineering	**C114.1:** Apply the concept of electric circuit laws, network reductiontheorems. **C114.2:** Explain the basic operation of electrical machines and transformers. **C114.3:** Illustrate the operation of renewable energy sources, lamps, batteries and protective devices. **C114.4:** Explain the operations and characteristics of various electronicdevices. **C114.5:** Determine various types of errors present in measurements andexplain the operating principles of different meters, transducers.
C115-GE8291 Environmental Science and Engineering	**C115.1:** Understand the importance of Environment, biodiversity, ecosystem and how to solve environmental related problems. **C115.2:** Identify and explain about the causes, effect and control measures of air pollution, water pollution, soil pollution, noise pollution, radioactive pollution and thermal pollution with its relevant case studies. **C115.3:** Discuss the various renewable and non-renewable resources and energy conservation processes. **C115.4:** Explain the social issues and solutions for sustainable environment with relevant Act and case studies. **C115.5:** Summarize the impact of human population in the environment and its remedial measures.
C116-CS8251 Programming in C	**C116.1:** Develop simple applications in C using basic constructs. **C116.2:** Design and implement applications in C using arrays and strings. **C116.3:** Develop and implement applications in C using functions and pointers.

	C116.4: Apply the concepts of structure and develop applications in Cusing structures.
	C116.5: Design applications using sequential and random access fileprocessing
C117-GE8261 EngineeringPractices Laboratory	**C117.1:** Construct Electrical and Electronic circuit.
	C117.2: Examine different types of electronic circuits and components.
	C117.3: Recognize electrical safety rules, grounding, general housing wiring.
	C117.4: Explore soldering practice.
C118-CS8261 C Programming Laboratory	**C118.1:** Develop C programs for simple applications making use ofbasic constructs.
	C118.2: Implement C programs for simple applications using arrays andstrings.
	C118.3: Develop C programs involving functions, recursion and pointers.
	C118.4: Design and implement application in C using structures.
	C118.5: Design applications using sequential and random access fileprocessing.
Semester – III	
C201-MA8351 Discrete Mathematics	**C201.1:** Have knowledge of the concepts needed to test the logic of aprogram.
	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 structuressuch as groups, rings and fields.
C202-CS8351 Digital Principles and System Design	**C202.1:** Analyze different methods used for simplification of Booleanexpressions
	C202.2: Design and implement Combinational logic circuits and writesimple HDL codes for combinational circuits
	C202.3: Design and implement the synchronous sequential logic circuitsand write simple HDL codes for sequential circuits
	C202.4: Implement asynchronous sequential logic circuits
	C202.5: Apply the concepts of memory devices and programmable logic devices in Integrated Circuits.
C203-CS8391 Data Structures	**C203. 1:** Implement the operations of list ADT with examples.

	C203.2: Apply the stack and queue ADTs to problem solutions. **C203.3:** Design non-linear data structure like tree for various applications. **C203.4:** Apply non-linear data structure – graph and its operation forsolving various problems. **C203.5:** Analyze the different sorting, searching algorithms and hashingtechniques.
C204-CS8392 Object Oriented Programming	**C204.1:** Develop Java programs using OOP principles. **C204.2:** Develop Java programs with the concepts inheritance and interfaces. **C204.3:** Build Java applications using exceptions and I/O streams **C204.4:** Develop Java applications with threads and generics classes **C204.5:** Develop interactive Java programs using swings.
C205-EC8395 Communication Engineering	**C205.1:** Comprehend and appreciate the significance and role of thiscourse in the present contemporary world **C205.2:** Apply analog and digital communication techniques. **C205.3:** Use data and pulse communication techniques for various applications. **C205.4:** Analyze Source and Error control coding **C205.5:** Describe about various techniques in Multiple access schemes.
C206-CS8381 Data StructuresLaboratory	**C206.1:** Write functions to implement linear data structure operations. **C206.2:** Suggest appropriate linear / non-linear data structure operationsfor solving a given problem. **C206.3:** Appropriately use the linear / non-linear data structure operations for a given problem. **C206.4:** Apply appropriate hash functions that result in a collision freescenario for data storage and retrieval. **C206.5:** Choose appropriate searching and sorting algorithm for an application and implement it in a modularized way.
C207-CS8383 Object Oriented Programming Laboratory	**C207.1:** Develop and implement Java programs for simple applicationsthat make use of classes, packages and interfaces. **C207.2:** Develop and implement Java programs with exception handlingand multithreading. **C207.3:** Develop and implement Java programs using Stack ADT andArray List using Interfaces **C207.4:** Design applications using file processing, generic programmingand event handling. **C207.5:** Develop and deploy mini-projects using Java concepts.
C208-CS8382 Digital Systems Laboratory	**C208.1:** Implement simplified combinational circuits using basic logic gates

	C208.2: Implement combinational circuits using MSI devices **C208.3:** Implement sequential circuits like registers and counters **C208.4:** Simulate combinational and sequential circuits using HDL
C209-HS8381 Interpersonal Skills/Listening &Speaking	**C209.1:** Listen and respond appropriately. **C209.2:** Participate in group discussions **C209.3:** Make effective presentations **C209.4:** Participate confidently and appropriately in conversations bothformal and informal.
Semester IV	
C211-MA8402 Probability and Queuing Theory	**C211.1:** Understand the fundamental knowledge of the concepts of probability and have knowledge of standard distributions which can describe real life phenomenon. **C211.2:** Understand the basic concepts of one and two dimensional random variables and apply in engineering applications. **C211.3:** Apply the concept of random processes in engineering disciplines. **C211.4:** Acquire skills in analyzing queuing models. **C211.5:** Understand and characterize phenomenon which evolve with respect to time in a probabilistic manner.
C212-CS8491 Computer Architecture	**C212.1:** Analyze the performance of the computer operations and understand the instructions in MIPS architecture. **C212.2:** Design arithmetic and logic unit for fixed-point and floating-point operation. **C212.3:** Design and describe the function of control unit, pipeline forexecution of instructions and types of hazards. **C212.4:** Classify and explain the different parallel processing techniquesand parallel processor. **C212.5:** Explain the memory hierarchy, input/output mechanism and evaluate the performance of the memory system.
C213-CS8492 Database Management Systems	**C213.1:** Design relational databases for applications. **C213.2:** Map ER model to Relational model to perform database designeffectively and write queries using normalization criteria. **C213.3:** Apply concurrency control and recovery mechanisms for practical problems. **C213.4:** Compare and contrast various indexing strategies in differentdatabase systems. **C213.5:** Appraise how advanced databases differ from traditionaldatabases.

C214-CS8451 Design and Analysis of Algorithms	**C214.1:** Analyze the time and space complexity of algorithms. **C214.2:** Design algorithms for various computing problems using brute force and divide-and conquer technique. **C214.3:** Design various computing problems and algorithms using dynamic programming and greedy technique. **C214.4:** Apply the iterative improvement techniques for solving problems. **C214.5:** Critically analyze the different algorithm design techniques for a given problem and modify existing algorithms to improve efficiency.
C215-CS8493 OperatingSystems	**C215.1:** Summarize the basic concepts System call, structure and functions of Operating Systems. **C215.2:** Explain the various scheduling algorithms, deadlock prevention, deadlock avoidance algorithms and principles of concurrency. **C215.3:** Compare and contrast the various memory management schemes. **C215.4:** Summarize the functionalities of File Systems and I/O Systems. **C215.5:** Perform administrative tasks on Linux servers and summarize the concepts of Mobile OS.
C216-CS8494 Software Engineering	**C216.1:** Describe the purpose and facts of different software development process models with an insight into generic process framework. **C216.2:** Identify the functional and non-functional requirements for software development by preparing IEEE Software Requirements Document. **C216.3:** Explain software design activities using data flow diagrams and architectural diagrams. **C216.4:** Develop a testing framework by understanding the purposes and stages of software testing and test-driven development. **C216.5:** Explain the project management activities involved in developing a framework including planning, scheduling, risk assessment/management.
C217-CS8481 Database Management Systems Laboratory	**C217.1:** Use typical data definitions and manipulation commands. **C217.2:** Design applications to test Nested and Join Queries. **C217.3:** Critically analyze the use of Tables, Views, Functions and Procedures. **C217.4:** Implement applications that require a Front-end Tool.
C218-CS8461 Operating Systems Laboratory	**C218.1:** Compare the performance of various CPU Scheduling Algorithms

	C218.2: Implement Deadlock avoidance and Detection Algorithms **C218.3:** Create processes and implement IPC, Semaphores **C218.4:** Analyze the performance of the various Page Replacement Algorithms **C218.5:** Implement File Organization and File Allocation Strategies.
C219-HS8461 Advanced Reading and Writing	**C219.1:** Read and evaluate different types of texts critically and predictcontent. **C219.2:** Write different types of essays using appropriate discourse markers. **C219.3:** Display critical thinking in various professional contexts. **C219.4:** Write winning job applications. **C219.5:** Prepare technical documents like project proposals and statement of purpose.
Semester V	
C301-MA8551 Algebra andNumber Theory	**C301.1:** Apply the basic notions of groups, rings, fields which will thenbe used to solve related problems.. **C301.2:** Explain the fundamental concepts of advanced algebraand their role in modern mathematics and applied contexts.. **C301.3:** Demonstrate accurate and efficient use of advanced algebraictechniques. **C301.4:** Demonstrate their mastery by solving non – trivial problems related to the concepts, and by proving simple theorems about the, statements proven by the text. **C301.5:** Apply integrated approach to number theory and abstract algebra, and provide a firm basis for further reading and study in the subject.
C302-CS8591 Computer Networks	**C302.1:** Identify the basic layers and its functions in computernetworks. **C302.2:** Elucidate the data flows from one node to another and the media access control methods for transmission. **C302.3:** Analyze and design routing algorithms. **C302.4:** Apply the detailed inner workings of transport layer. **C302.5:** Analyze the features and operations of various application layer protocols such as HTTP, DNS, and SMTP.

C303-EC8691 Microprocessorsand Microcontrollers	**C303.1:** Describe the architecture of microprocessor 8086 and executeprograms based on 8086 microprocessor **C303.2:** Explain about 8086 system bus structure and design memoryinterfacing circuits. **C303.3:** Design and interface I/O circuits with 8086 microprocessor. **C303.4:** Describe the architecture of microcontroller 8051. **C303.5:** Implement 8051 microcontroller based systems.
C304-CS8501 Theory of Computation	**C304.1:** Construct and convert the Deterministic and Non deterministicfinite automata for any given regular language. **C304.2:** Write regular expression for any regular language and find equivalence of regular expression and finite automata.. **C304.3:** Write the context free grammar and Construct the pushdownautomata for the context free language **C304.4:** Explain the properties of the context free language and design Turing machine for any given language **C304.5:** Derive the given problem is decidable or un-decidable
C305-CS8592 Object Oriented Analysis and Design	**C305.1:** State the usage of different UML diagrams and Unified process. **C305.2:** Express software design with UML static diagrams. **C305.3:** Express software design with UML dynamic and implementationDiagrams. **C305.4:** Transform UML based software design into pattern based Design using design patterns. **C305.5:** Explain the various testing methodologies for OO software
C306-OTL553 – Telecommunication and Network Management	**C306.1:** Design and analyze of fault management **C306.2:** Analyze the common management information protocol specifications **C306.3:** Design and analyze of management information model **C306.4:** Design the simple network management protocol. **C306.5:** Design the various types of network management tools.
C307-EC8681 Microprocessors and Microcontrollers Laboratory	**C307.1:** Write ALP programmes for arithmetic operation, logical operations and data movement using 8086 microprocessor instructions. **C307.2:** Implement ALP programmes for code conversion, decimal arithmetic and matrix operations using 8086 instructions.. **C307.3:** Generate result for floating point operations, string manipulations,sorting and searching using 8086 microprocessor Instructions. **C307.4:** Design 8086/8051 based systems using peripherals and Interfaces. **C307.5:** Calculate outputs for arithmetic operation, logical operation, square of a number and cube of a number using 8051
C308-CS8582 Object Oriented Analysis and Design Laboratory	**C308.1:** Design and implement projects using Object Oriented concepts. **C308.2:** Use the UML analysis and design diagrams. **C308.3:** Apply appropriate design patterns.. **C308.4:** Create code from design. **C308.5:** Compare and contrast various testing techniques

C309-CS8581 Networks Laboratory	**C309.1:** Use various network commands. **C309.2:** Perform client-server communication between two desktopComputers using Socket Programming. **C309.3:** Implement the different network protocols. **C309.4:** Simulate the algorithms with the help of Network Simulator tool **C309.5:** Analyze the different routing algorithms.
Semester – VI	
C311-CS8651 Internet Programming	**C311.1:** Create website using HTML and Cascading Style Sheets. **C311.2:** Build web pages with Client side programming using Java Script **C311.3:** Develop server side programs using Servlets and JSP. **C311.4:** Construct simple web pages in PHP and to represent data in XML format. **C311.5:** Develop interactive web applications using AJAX and web services.
C312-CS8691 Artificial Intelligence	**C312.1:** Elucidate the characteristics of intelligent agents. **C312.2:** Use appropriate search algorithms for any AI problem. **C312.3:** Represent a problem using first order and predicate logic. **C312.4:** Design the apt software agents to solve a problem. **C312.5:** Design the applications for Artificial Intelligence
C313-CS8601 Mobile Computing	**C313.1:** Explain the basics of mobile computing and MAC protocols. **C313.2:** Illustrate the generations of mobile telecommunication systems inwireless networks. **C313.3:** Determine the functionality of MAC, network layer and identify arouting protocol for a given Ad hoc network. **C313.4:** Describe the functionality of mobile transport and application layers. **C313.5:** Develop a mobile application using android/iOS/Windows SDK.
C314-CS8602 CompilerDesign	**C314.1:** Implement different phases of a compiler and design a lexical analyzer for a sample language. **C314.2**: Apply different parsing algorithms to develop the parsers for a given grammar. **C314.3**: Explain the Intermediate code generation and syntax-directed translation. **C314.4**: Describe the run-time environment and implement a simple code generator. **C314.5**: Implement code optimization techniques.
C315-CS8603 DistributedSystems	**C315.1:** Elucidate the foundations and issues of distributed systems **C315.2:** Explore the various synchronization issues and global state for distributed systems. **C315.3:** Comprehend the idea of the Mutual Exclusion and Deadlockdetection algorithms in distributed systems **C315.4:** Describe the agreement protocols and fault tolerance mechanismsin distributed systems. **C315.5:** Describe the features of peer-to-peer and distributed sharedmemory systems

C316-IT8076 Software Testing	**C316.1:** Describe and interpret the basics of software testing and the generic testing process **C316.2:** Develop test cases suitable for various domains using multiple testcase design strategies **C316.3:** Interpret the various levels of testing and identify the suitable teststo be carried out **C316.4:** Prepare the test plan, develop the test plan and validate the testplan **C316.5:** Apply multiple automation tools for testing and assess the varioustesting metrics
C317-CS8661 Internet Programming Laboratory	**C317.1:** Design Web pages using HTML and style sheets. **C317.2:** Develop dynamic web pages using client and server side scripting. **C317.3:** Design web pages using PHP and Database. **C317.4:** Create web applications using XML and Web Services. **C317.5:** Create web applications using Web Services
C318-CS8662 Mobile Application Development Laboratory	**C318.1:** Develop mobile applications using GUI and Layouts **C318.2:** Develop mobile applications using Event Listener **C318.3:** Develop mobile applications using Database **C318.4:**Implement various mobile applications using RSS Feed, Internal/External Storage, SMS, Multithreading and GPS **C318.5:** Analyze and discover own mobile app for simple needs
C320-HS8581 Professional Communication	**C320.1:** Exhibit soft skills and awareness of different cultures in varied contexts. **C320.2:** Make effective presentations. **C320.3:** Participate confidently in Group Discussions. **C320.4:** Attend job interviews and be successful in them. **C320.5:** Set short-term and long-term career goals.
Semester - VII	
C401-MG8591 Principles of Management	**C401.1:** Discuss the evolution of management, functions and roles of managers. **C401.2:** Explain the different types of plans, Steps in planning process andtools used for planning. **C401.3:** Elaborate different organization structures and functions of humanresources manager. **C401.4:**Interpret the concepts in motivation techniques, leadershipcommunication processes **C401.5:** Describe the control techniques and the role of technology inmanagement
C402-CS8792 Cryptographyand Network Security	**C402.1:** Interpret the basic concepts, OSI security architecture and classicalencryption. **C402.2:** Apply the various Symmetric Cryptographic techniques. **C402.3:** Apply the various public key Cryptographic techniques. **C402.4:** Determine the usage of hash functions and digital signature.**C402.5:** Interpret the various secure applications.

C403-CS8791 Cloud Computing	**C403.1:** Articulate the main concepts, key technologies, strengths andlimitation of cloud computing. **C403.2:** Identify the key enabling technologies that help in the development of cloud. **C403.3:** Develop the ability to identify and use the architecture ofcompute and storage cloud, service and delivery model. **C403.4:** Elucidate the core issues of cloud computing such as resourcemanagement and security. **C403.5:** Evaluate and choose the appropriate technologies, algorithms andapproaches for implementation and use of cloud.
OME752-Supply Chain Management(Open Elective)	**CO1:** provide an insight on the fundamentals of supply chain networks, tools and techniques. **CO2:** Discuss about the supply chain network design **CO3:** Elaborate about the various logistics in supply Chain. **CO4:**Discuss about sourcing and coordination in supply Chain. **CO5:** Describe how the supply chain measures in Information industries
C406-CS8079 Human Computer Interaction	**C406.1:** Explain the basic foundations of Human Computer Interaction. **C406.2:** Design the effective HCI for individuals and persons withdisabilities **C406.3:** Simplify the issues in the HCI Models and assess the importance ofuser feedback. **C406.4:** State the mobile HCI implications for designing multimedia/e-commerce/ e-learning web sites. **C406.5:** Develop the meaningful user interface.
C405-IT6801 Service OrientedArchitecture (E-I)	**C405.1** Develop a simple XML document coding and XML Schema. **C405.2** Create an application based on XML and database. **C405.3** Compare the characteristics and principles of Service oriented architecture with client server and distributed architecture. **C405.4** Describe the web services using WSDL, SOAPand UDDI. **C405.5** Build a Service oriented architecture based applications For Intra-enterprise and inter- enterprise applications using J2EE.
CS8711 Cloud Computing Laboratory	**CO1:** Configure various virtualization tools such as Virtual Box,VMware workstation. **CO2:** Design and deploy a web application in a PaaS environment. **CO3:** Learn how to simulate a cloud environment to implementnew schedulers. **CO4:** Install and use a generic cloud environment that can beused as a private cloud. **CO5:** Manipulate large data sets in a parallel environment

IT8761 Security Laboratory	**CO1:** Implement classical Encryption Techniques **CO2:** Build cryptosystems by applying symmetric and public key encryption algorithms **CO3:** Implement authentication algorithms **CO4:** Develop a signature scheme using Digital signature standard **CO5:** Demonstrate the network security system using open source tools
Semester VIII	
C411-GE6075- Professional Ethics in Engineering	**C411.1** Apply ethics, morals and human values in society. **C411.2** Explain about engineering ethics. **C411.3** Describe the responsibilities of engineers as experimenters. **C411.4** Recognize the safety, risks, risk benefit analysis and rights of an engineer. **C411.5** Discuss the importance of the global issues, moral leadership and code of conduct.
C412-CS8080 Information Retrieval Techniques(Elective)	**C412.1** Use an open source search engine framework and explore its capabilities **C412.2** Modeling And Retrieval Evaluation **C412.3** Apply appropriate method of classification or clustering. **C412.4** Design and implement innovative features in a search engine **C412.5** Design and implement a recommender system.

| CS413-CS6811 PROJECT WORK | **C413.1** Apply the fundamental knowledge and skills, Which areacquired within the technical area, to a given problem
C413.2 Identify and summarize an appropriate list of literature review, analyze previous researchers' Work and relate them to the project.
Within given constraints, even with limited information, the students will be able to independently analyze and discuss complex inquiries/problems and handle larger problems on the advanced level within the technical area.
C413.3 Design engineering solutions to complex problems in asystematic approach.
Identify and apply appropriate parameters, assumptions and design criteria in consideration of health and safety (example: theuse of codes of practice), ethics, economics, environment, sustainability.
C413.4 Apply research and conduct experiments, as well as to analyzeand interpret data that yield the results and answer importantapplicable research questions.
C413.5 Utilize technology tools for communication, collaboration, information management, and decision support.
C413.6 Demonstrate the knowledge, skills and attitudes of aprofessional engineer.
C413.7 Interact with team members in a professional manner, respecting differences, to ensure a collaborative projectenvironment.
CO413.8 Demonstrate a strong working knowledge of ethics and professional responsibility.
C413. 9 Document and present one's own work, for a given targetgroup, with strict requirements on structure, format, andlanguage usage.
C413.10 Present the project outlining the approach and expected resultsusing good oral and written presentation skills.
C413.11 Demonstrate effective organizational leadership and changeskills for managing projects and project teams.
C413.12 Recognize the need for life-long learning by undergoing theproject work. |