# Department of Information Technology
# List of Course Outcomes for 2019 Regulation

| Sl No. | Year & Semester | Course Code | Course Name | Course Outcome |
|---|---|---|---|---|
| 1 | 1st Year and 1st Semester | U19HS101 | TECHNICAL ENGLISH | 1. CO1: (Understand) Express their ideas effectively using appropriate vocabulary |
| | | | | 2. CO2: (Apply) Develop reading skills with the help of relevant reading strategies |
| | | | | 3. CO3: (Apply) Apply various interactive techniques for effective communication |
| | | | | 4. CO4: (Apply) Write letters, Contents and articles with proper structure |
| | | | | 5. CO5: (Apply) Make use of writing skills to communicate effectively |
| 2 | | U19MA101 | MATRIX ALGEBRA AND CALCULUS | 1. CO1: (Apply) Determine inverse, higher integral powers by Cayley Hamilton theorem and convert quadratic form to canonical form by orthogonal transformation |
| | | | | 2. CO2: (Analyze) Analyze the convergence or divergence of series of positive terms and alternating series by various techniques. |
| | | | | 3. CO3: (Analyze) Classify the extreme values of functions of two variables and functional dependence. |
| | | | | 4. CO4: (Apply) Apply integration concepts to compute area of the given surfaces, integrals in cartesian and polar coordinates. |
| | | | | 5. CO5: (Apply) Apply triple integration concepts to compute volume of the given surfaces and solid structure and area, volume of the surface using Gamma and Beta functions. |
| 3 | | U19CY101 | ENGINEERING CHEMISTRY | 1. CO1: (Apply) Apply the principles of electrochemistry and corrosion in engineering. |
| | | | | 2. CO2: (Understand) Understand the quality of water, and its treatment methods. |
| | | | | 3. CO3: (Apply) Apply the concepts relevant to thermodynamics. |
| | | | | 4. CO4: (Understand) Understand the Engineering materials. |
| | | | | 5. CO5: (Understand) Understand the science of polymer and polymer reactions. |
| 4 | | U19CS101 | PROBLEM SOLVING USING C | 1. CO1: (Understand) Understand appropriate looping and conditional constructs for given problems |
| | | | | 2. CO2: (Understand) Understand pointers, arrays and strings to solve complex problems |
| | | | | 3. CO3: (Understand) Understand Structures, unions and files for problem solving |
| | | | | 4. CO4: Understand) Understand problem solving techniques to real world problems |
| | | | | 5. CO5: (Understand) Understand use of functions to build modular programming |
| 5 | | U19ME101 | ENGINEERING GRAPHICS | 1. CO1: (Apply) Draw orthographic projection to represent three dimensional objects in two dimensional views |
| | | | | 2. CO2: (Apply) Communicate industry standards through engineering drawings |
| | | | | 3. CO3: (Apply) Draw the projection of simple solids using graphic principles |
| | | | | 4. CO4: (Apply) Draw the sectional views of simple solids and develop the surfaces of sheet metal components. |
| | | | | 5. CO5: (Apply) Draw isometric projection and perspective projection of simple objects |
| 6 | | U19CY111 | CHEMISTRY LABORATORY | 1. CO1: (Analyse) Analyse the role of water quality related parameters. |
| | | | | 2. CO2: (Create) Design the engineering materials against corrosion. |
| 7 | | U19GE111 | ENGINEERING PRACTICES LABORATORY | 1. CO1: (Apply) Fabricate and experiment with Mechanical and Carpentry components and pipe connections. |
| | | | | 2. CO2: (Apply) Use fabrication tools to join and assembling the structures. |
| | | | | 3. CO3: (Apply) Identify and Illustrate the various parts of pumps, plumbing works, welding and machine tools. |
| | | | | 4. CO4: (Apply) Apply electrical & electronic fundamentals to understand basic circuit elements and emerging technologies |
| | | | | 5. CO5: (Apply) Use electrical fundamentals to solve domestic / industrial wiring faults. |
| 8 | | U19CS111 | PROBLEM SOLVING USING C LABORATORY | 1. CO1: (Apply) Solve problems using data types and operators |
| | | | | 2. CO2: (Apply) Apply appropriate looping and conditional constructs for given C programs |
| | | | | 3. CO3: (Apply) Use functions to build modular programs |
| | | | | 4. CO4: (Apply) Use appropriate IDE and tools to write, compile, debug and execute a C Program. |
| | | | | 5. CO5: (Apply) Implement structures, unions and File Operations |
| 9 | | U19EM101 | SOFT SKILLS | 1. CO1: (Apply) Apply the basic personality traits in social activity for future working environment |
| | | | | 2. CO2: (Apply) Apply receptiveness and get customized to today's corporate world |
| | | | | 3. CO3: (Analyze) Analyze and mingle with different types of people to overcome and eradicate fear |
| | | | | 4. CO4: (Apply) Create a team environment in the classroom to measure their individual team player skills |
| | | | | 5. CO5: (Apply) Create a vivid vision about their behaviour and discipline in future and through which they can measure themselves in socializing |

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| 10 | | U19MA102 | ADVANCED CALCULUS AND COMPLEX VARIABLES | 1. CO1: (Analyze) Compare the ideas of vector integral theorems for solving given problems and exhibit the relation between them. |
| | | | | 2. CO2: (Apply) Make use of Milne Thomson method to construct analytic functions related to complex variable. |
| | | | | 3. CO3: (Apply) Apply the concepts of integration for complex functions in certain regions to determine real integrals. |
| | | | | 4. CO4: (Apply) Apply Laplace transform and inverse transform of simple functions, properties, various related theorems and application to differential equations with constant coefficients. |
| | | | | 5. CO5: (Apply) Apply various techniques in solving differential equations. |
| 11 | | U19PH101 | ENGINEERING PHYSICS | 1. CO1: (Apply) Learn the basic of properties of matter and its applications |
| | | | | 2. CO2: (Apply) Acquire knowledge on the concepts of optical devices and their applications in fibre optics |
| | | | | 3. CO3: (Apply) Have adequate knowledge on the concepts of thermal properties of materials and their applications in expansion joints and heat exchangers. |
| | | | | 4. CO4: (Apply) Get knowledge on advanced physics concepts of quantum theory and its applications in tunneling microscopes. |
| | | | | 5. CO5: (Understand) Understand the basics of quantum structures and their applications in spintronics and carbon electronics. |
| 12 | | U19EE101 | BASIC ELECTRICAL AND ELECTRONICS ENGINEERING | 1. CO1: (Understand) Revise the basic concepts in electrical and electronics engineering |
| | | | | 2. CO2: (Understand) Explain the basic laws governing electric circuits, operation of electrical and electronic devices and digital circuits. |
| | | | | 3. CO3: (Understand) Summarize the various applications of electrical machines and electronic devices. |
| | | | | 4. CO4: (Apply) Apply the laws and concepts to predict the performance of electrical circuit and machines. |
| | | | | 5. CO5: (Apply) Identify the operating characteristics of semiconductor devices, analog and digital circuits |
| 13 | 1st Year and 2nd Semester | U19CS102 | PYTHON PROGRAMMING | 1. CO1: (Apply) Write python programs using appropriate data types |
| | | | | 2. CO2: (Apply) Develop modular programs using functions |
| | | | | 3. CO3: (Understand) Understand the object oriented concepts |
| | | | | 4. CO4: (Apply) Solve problems using list, tuple and dictionary |
| | | | | 5. CO5: (Apply) Apply exception handling concepts to various problems |
| 14 | | U19EC102 | DIGITAL SYSTEM DESIGN | 1. CO1: (Understand) Write the HDL codes for combinational and Sequential Circuits |
| | | | | 2. CO2: (Apply) Implementation of simplified Boolean Expressions for designing combinational and sequential circuits using logic gates |
| | | | | 3. CO3: (Apply) Implementation of the PLDs proposed for combinational circuit design |
| | | | | 4. CO4: (Analyze) Simplify the Boolean functions using KMap |
| | | | | 5. CO5: (Analyze) Analyze the synchronous and asynchronous sequential complex digital circuits for real time applications |
| 15 | | U19PH111 | PHYSICS LABORATORY | 1. CO1: (Understand) Understand the various experiments in the areas of optics, mechanics and thermal physics will nurture the students in all branches of Engineering. |
| | | | | 2. CO2: (Apply) Interpret and formulate experiments in engineering physics. |
| 16 | | U19CS112 | PYTHON PROGRAMMING LABORATORY | 1. CO1: (Apply) Use Python shell and IDE to write and debug simple Python programs |
| | | | | 2. CO2: (Apply) Use Python lists, tuple, dictionaries for representing compound data. |
| | | | | 3. CO3: (Apply) Identify appropriate packages and modules for different problems |
| | | | | 4. CO4: (Apply) Choose the appropriate conditional and looping |
| | | | | 5. CO5: (Apply) Create simple applications using python |
| 17 | | U19EC112 | DIGITAL SYSTEM DESIGN LABORATORY | 1. CO1: (Apply) Implementation of various combinational circuits |
| | | | | 2. CO2: (Apply) Implementation of various combinational and sequential circuits using HDL |
| | | | | 3. CO3: (Apply) Implementation of asynchronous counters |
| | | | | 4. CO4: (Apply) Implementation the synchronous counters |
| | | | | 5. CO5: (Apply) Implementation of shift registers |
| 18 | 2nd Year and 3rd Semester | U19MA203 | DISCRETE MATHEMATICS | 1. CO1: (Apply) Apply principles and fundamental concepts of inference theory in proving and testing the logics |
| | | | | 2. CO2: (Apply) Use induction techniques, generating functions and basics of counting to solve mathematical statements |
| | | | | 3. CO3: (Apply) Examine the types of circuits in a graph, the existence of isomorphism and sketch the Euler and Hamiltonian paths and circuits in a graph |
| | | | | 4. CO4: (Apply) Apply the concepts of algebraic structures with one or more binary operations |
| | | | | 5. CO5: (Apply) Apply integrated approach to number theory provide a firm basis. |

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| 19 | | U19PH201 | PHYSICS FOR INFORMATION SCIENCE | 1. CO1: (Understand) Understand the basics of crystals, their structures and different crystal growth techniques.<br>2. CO2: (Apply) Identify and solve problems concerning physical parameters related to electrical and superconductivity in different situations.<br>3. CO3: (Understand) Acquire knowledge on basics of semiconductor physics and its applications in various devices.<br>4. CO4: (Understand) Gain knowledge on magnetic properties of materials and their suitability in engineering applications.<br>5. CO5: (Apply) Interpret the knowledge on behaviour of modern optoelectronic materials and their applications. |
| 20 | | U19CS201 | DATA STRUCTURES | 1. CO1: (Understand) Comprehend the working of linear data structures and identify their applications.<br>2. CO2: (Apply) Applyrecursion on specific applications.<br>3. CO3: (Understand) Understand the various tree data structures for efficient storage and retrieval of data.<br>4. CO4: (Apply) Employ graph data structure for solving real world problems.<br>5. CO5: (Apply) Apply suitable methods for efficient data access through hashing. |
| 21 | | U19CS202 | DATABASE MANAGEMENT SYSTEMS | 1. CO1: (Apply) Use fundamentals of data models and depict a database system<br>2. CO2: (Apply) Implement relational databases for various business requirements.<br>3. CO3: (Apply) Analyse and implement the properties of database.<br>4. CO4: (Apply) Use the application technology for various evaluation techniques and recovery process in database storage.<br>5. CO5: (Apply) Use non-structured database systems in application development. |
| 22 | 2nd Year and 3rd Semester | U19CS203 | OBJECT ORIENTED PROGRAMMING | 1. CO1: (Apply) Understand and apply the features of object oriented programming paradigm and Java Semantics<br>2. CO2: (Apply) Identify and apply appropriate object oriented concepts of java in problem solving by adhering to Java Coding standards<br>3. CO3: (Apply) Apply concepts of java collections API for the given scenario<br>4. CO4: (Apply) Apply multithreading concepts in concurrent application development<br>5. CO5: (Apply) Use relevant exception-handling mechanisms to ensure uninterrupted flow of application. |
| 23 | | U19MC202 | INDIAN CONSTITUTION AND TRADITION | 1. CO1: (Understand) Understand the characteristics of the Constitution of India<br>2. CO2: (Understand) Understand the fundamental rights and duties<br>3. CO3: (Understand) Understand the federal structure and distribution of legislative and financial powers<br>4. CO4: (Understand) Understand the constitutional amendments and emergency provisions<br>5. CO5: (Understand) Understand the fundamental right to equality, freedom, life and personal freedom |
| 24 | | U19CS211 | DATA STRUCTURES LABOROTARY | 1. CO1: (Apply) Apply linear data structures to solve problems.<br>2. CO2: (Apply) Implement the concept of trees and graphs using non-linear data structures.<br>3. CO3: (Apply) Select suitable tree algorithms for efficient data storage and retrieval with better time complexity.<br>4. CO4: (Apply) Apply linear and non-linear data structure and develop a real time software application.<br>5. CO5: (Apply) Apply the different hashing data structure for efficient data storage. |
| 25 | | U19CS212 | DATABASE MANAGEMENT SYSTEMS LABORATORY | 1. CO1: (Apply) Develop ER model for the given problem.<br>2. CO2: (Apply) Apply appropriate SQL constraints to a business case.<br>3. CO3: (Apply) Utilize relational database using simple and complex queries in Structured Query Language (SQL).<br>4. CO4: (Apply) Formulate procedural language queries (PL/SQL) to the given scenario.<br>5. CO5: (Apply) Apply database connectivity concepts in an application development scenario. |
| 26 | | U19CS213 | OBJECT ORIENTED PROGRAMMING LABORATORY | 1. CO1: (Apply) Use JRE, JDK and Java-IDE's<br>2. CO2: (Apply) Select the required Object oriented mechanism<br>3. CO3: (Apply) Use relevant exception-handling mechanisms exception<br>4. CO4: (Apply) Model the real world problems for efficient outcomes using concurrency concepts<br>5. CO5: (Apply) Apply concepts of java collections API for the given scenario |
| 27 | 2nd Year and 4th Semester | U19MA206 | PROBABILITY AND STATISTICS | 1. CO1: (Apply) Apply the basic probability concepts for random variables and random experiments.<br>2. CO2: (Analyze) Analyze various standard distributions applicable to engineering which can describe real life phenomenon.<br>3. CO3: (Analyze) Analyze the functions of two dimensional random variables through its probability values.<br>4. CO4: (Apply) Apply statistical tests in testing of hypothesis.<br>5. CO5:(Analyze) Estimate the values of parameters based on measured empirical data that has a random component. |

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| 28 | | U19IT201 | SOFTWARE ENGINEERING | 1. CO1: (Apply) Apply appropriate software engineering model for a given development scenario. |
| | | | | 2. CO2: (Apply) Apply appropriate requirement engineering techniques for real time projects. |
| | | | | 3. CO3: (Apply) Compare and choose the suitable design models for the given application scenario. |
| | | | | 4. CO4: (Apply) Modelling the application based on the customer requirements. |
| | | | | 5. CO5: (Apply) Apply the testing principles to software project development. |
| 29 | | U19CS204 | OPERATING SYSTEMS | 1. CO1: (Understand) Use the appropriate concepts of operating system for resource utilization |
| | | | | 2. CO2: (Understand) Choose the relevant process and thread concepts for solving synchronization problems |
| | | | | 3. CO3: (Understand) Compare different types of page replacement algorithms in memory management |
| | | | | 4. CO4: (Understand) Experiment the performance of different algorithms used in management of memory, file and I/O and selects the appropriate one. |
| | | | | 5. CO5: (Understand) Demonstrate different device and resource management techniques for memory utilization with security mechanisms |
| 30 | | U19CS205 | DESIGN AND ANALYSIS OF ALGORITHMS | 1. CO1: (Understand) Estimate the time and space complexities of algorithms. |
| | | | | 2. CO2: (Apply) Apply algorithm analysis techniques for a given algorithms. |
| | | | | 3. CO3: (Analyse) Analyse different algorithms for solving a given problem. |
| | | | | 4. CO4: (Apply) Apply various graph traversal techniques to find the shortest path. |
| | | | | 5. CO5: (Understand) Compare the time and space complexities of different types of algorithms. |
| 31 | 2nd Year and 4th Semester | U19MC201 | ENVIRONMENTAL SCIENCES | 1. CO1: (Analyse) Analyse human interaction for the sustainability of a social eco-system. |
| | | | | 2. CO2: (Analyse) Examine the impact of pollution and hazardous chemical on environment and human health. |
| | | | | 3. CO3: (Analyse) Inspect the effect of different wastes and chemical on the environment and its mitigation methods. |
| | | | | 4. CO4: (Apply) Identify the application of natural resources for creating a good eco-system. |
| | | | | 5. CO5: (Analyse) Apply the basic concepts to understand various environmental issues. |
| 32 | | U19IT211 | SOFTWARE ENGINEERING LAB | 1. CO1: (Analyze) Analyze problem statements to identify the requirements of real time scenarios. |
| | | | | 2. CO2: (Apply) Examine project scope, objectives and perform project planning. |
| | | | | 3. CO3: (Create) Develop software design solutions for the given problem domain. |
| | | | | 4. CO4: (Apply) Identify the deliverables in various phases of SDLC. |
| | | | | 5. CO5: (Apply) Apply various testing techniques on the deliverables. |
| 33 | | U19CS214 | OPERATING SYSTEMS LABORATORY | 1. CO1: (Apply) Use different LINUX commands and implement shell programming. |
| | | | | 2. CO2: (Apply) Simulate various system calls used for process and file management. |
| | | | | 3. CO3: (Apply) Implement process synchronization techniques and inter process communication mechanisms. |
| | | | | 4. CO4: (Analyze) Analyze various system programs under Linux to make use of operating system concepts. |
| | | | | 5. CO5: (Evaluate) Evaluate the performance of different file allocation strategies and select the appropriate one. |
| 34 | | U19EM201 | VERBAL AND SOFT SKILLS | 1. CO1: (Apply) Inculcate rhetorical skills to build confidence level. |
| | | | | 2. CO2: (Apply) Creative employability attribution for campus interview. |
| | | | | 3. CO3: (Apply) Improve verbal skills through vocabularies. |
| | | | | 4. CO4: (Apply) Develop comprehending ability in various contexts. |
| | | | | 5. CO5: (Apply) Improve sentence formation by collaborative learning methods. |
| 35 | 3rd Year and 5th Semester | U19IT301 | COMPUTER ARCHITECTURE | 1. CO1: (Understand) Choose appropriate instruction set architecture and addressing modes used in a processor. |
| | | | | 2. CO2: (Understand) Apply the knowledge of arithmetic operations to perform calculations. |
| | | | | 3. CO3: (Understand) Understand Design and analyze pipelined control units. |
| | | | | 4. CO4: (Understand) Understand parallel processing architectures. |
| | | | | 5. CO5: (Understand) Understand performance of memory systems. |
| 36 | | U19IT302 | WEB TECHNOLOGY | 1. CO1: (Understand) Understand and master the fundamentals of website development, such as HTML5, XHTML, CSS |
| | | | | 2. CO2: (Understand) Understand the function of Cascading Style Sheets (CSS) in Web communications and describe the relationship between CSS and HTM |
| | | | | 3. CO3: (Apply) Use the interactive web page styles using JavaScript and CSS and handling web page events. |
| | | | | 4. CO4: (Apply) Use the dynamic, database-driven web applications, such as use of a LAMP framework (Linux, Apache, MySQL, and PHP) and JavaScript (+ Ajax), among others, to develop robust online programs. |
| | | | | 5. CO4: (Apply) Apply the proficiency in Webpage Development and website management using wordpress and web services. |

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| 37 | 3rd Year and 5th Semester | U19CS302 | ARTIFICIAL INTELLIGENCE | 1. CO1: (Understand) Discuss the various Artificial Intelligence (AI) methods and describe their foundations. |
| | | | | 2. CO2: (Apply) Apply the various search techniques to real-time problems. |
| | | | | 3. CO3: (Apply) Use the automated reasoning techniques to real world problems. |
| | | | | 4. CO4: (Understand) Explain the various design software agents to solve a problem. |
| | | | | 5. CO5: (Apply) Apply the various learning techniques to real world application. |
| 38 | | U19IT303 | COMPUTER NETWORKS | 1. CO1: (Apply) Identify the functionalities of various protocols operating at each layer of OSI reference model. |
| | | | | 2. CO2: (Understand) Describe the working of LAN, WAN, MAN technologies and different network topologies. |
| | | | | 3. CO3: (Understand) Explain the working of IP layer and its routing algorithms. |
| | | | | 4. CO4: (Understand) Identify the components required to build different types of networks. |
| | | | | 5. CO5: (Apply) Demonstrate the working of principles security algorithms and application layer protocols for reliable data transmission. |
| 39 | | U19IT311 | COMPUTER NETWORKS LABORATORY | 1. CO1: (Apply) Develop skills to use simulation tools. |
| | | | | 2. CO2: (Apply) Develop client server applications using socket programming. |
| | | | | 3. CO3: (Apply) Implement of data link layer protocols. |
| | | | | 4. CO4: (Apply) Implement of network layer protocols. |
| | | | | 5. CO5: (Analyze) Analyze the performance of network protocols. |
| 40 | | U19IT312 | WEB TECHNOLOGY LABORATORY | 1. CO1: (Understand) Understand a static web page with HTML tags and multiple style sheets. |
| | | | | 2. CO2: (Apply) Use the Web Application Terminologies, Internet Tools and other web services. |
| | | | | 3. CO3: (Apply) Use the terminologies to build dynamic web pages using JavaScript (Client side programming). |
| | | | | 4. CO4: (Understand) Understand a form by using various attributes of the input tags. |
| | | | | 5. CO5: (Apply) Design and implement dynamic websites with good aesthetic sense of designing. |
| 41 | Semester V Professional Elective I | U19CS501 | INFORMATION RETRIEVAL | 1. CO1: (Understand)Understand the basic concepts of Information Retrieval |
| | | | | 2. CO2: (Understand)Understand data modelling and Retrieval Evaluation. |
| | | | | 3. CO3: (Understand)Develop the fundamental understanding of Classification and Clustering in Information Retrieval |
| | | | | 4. CO4: (Apply)Apply the concepts of web retrieval and crawling for a search engine |
| | | | | 5. CO5: (Apply) Implement the Recommendation techniques for recommender system. |
| 42 | | U19CS502 | DATA WAREHOUSING AND MINING | 1. CO1: (Understand)Understand basics of data warehousing |
| | | | | 2. CO2: (Understand)Understand basics of Data Mining |
| | | | | 3. CO3: (Apply)Apply frequent pattern and association rule mining techniques for data analysis |
| | | | | 4. CO4: (Apply)Apply appropriate classification techniques for data analysis |
| | | | | 5. CO5: (Apply)Apply the concepts of Data mining, Classification and Clustering for applications using weka tool |
| 43 | | U19CS512 | ADVANCED JAVA PROGRAMMING | 1. CO1: (Understand) Understand Java Language and Fundamentals |
| | | | | 2. CO2: (Understand) Understand object oriented concepts and functional style data processing |
| | | | | 3. CO3: (Understand) Understand the java libraries and know effective programming with streams |
| | | | | 4. CO4: (Understand) Understand the enhanced java features. |
| | | | | 5. CO5: (Apply) Create a system based application using AWT and Swing. |
| 44 | | U19IT501 | AGILE SOFTWARE DEVELOPMENT | 1. CO1: (Understand) Understand the theoretical aspects as well as practical understanding of agile software development practices and how small teams can apply them to create high-quality software. |
| | | | | 2. CO2: (Understand) Understand the agile scrum methodology, feature driven programming with scrum framework. |
| | | | | 3. CO3: (Understand) Understand the refactoring techniques and pair programming in project management. |
| | | | | 4. CO4: (Apply) Apply the background of testing in an agile project and the roles and responsibilities of a typical agile testing team |
| | | | | 5. CO5: (Apply) Use techniques and tools for improving team collaboration and software quality |
| 45 | | U19IT508 | MOBILE COMPUTING | 1. CO1: (Understand) Describe the characteristics, challenges and applications of mobile communication |
| | | | | 2. CO2: (Understand) Explain the MAC, Network, Transport Layer level schemes of mobile communication |
| | | | | 3. CO3: (Understand) Explain the architecture, design considerations of various telecommunication systems |
| | | | | 4. CO4: (Understand) Understand the various Wireless LAN standards |
| | | | | 5. CO5: (Apply) Apply the security system of Mobile communication |

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| 46 | **Semester V Professional Elective I** | U19IT509 | PARALLEL AND DISTRIBUTED COMPUTING | 1. CO1: (Understand) Understand the features and fundamentals of parallel computing paradigms |
| | | | | 2. CO2: (Understand) Understand the Parallel Algorithmic Models. |
| | | | | 3. CO3: (Understand) Learn the performance of parallel systems and parallel programming. |
| | | | | 4. CO4: (Understand) Demonstrate the design principles in distributed systems and the architectures for distributed systems. |
| | | | | 5. CO5: (Apply) Analyze fault tolerance and recovery in distributed systems and algorithms |
| 47 | | U19IT518 | INFORMATION TECHNOLOGY ESSENTIALS | 1. CO1: (Apply) Design and deploy web-sites. |
| | | | | 2. CO2: (Apply) Design and deploy simple web-applications. |
| | | | | 3. CO3: (Understand) Create simple database applications. |
| | | | | 4. CO4: (Apply) Develop information system. |
| | | | | 5. CO5: (Understand) Describe the basics of networking and mobile communications. |
| 48 | 3rd Year and 6th Semester | U19IT304 | COMPUTER GRAPHICS AND MULTIMEDIA | 1. CO1: (Understand) Impart the fundamental knowledge of basic graphics primitives, graphics software |
| | | | | 2. CO2: (Apply) Able to use the concept of dimensional transformations. |
| | | | | 3. CO3: (Apply) Interpret and demonstrate the concept of three dimensional graphics and modelling |
| | | | | 4. CO4: (Understand) Interpret the various multimedia communication standards, applications and basic principles. |
| | | | | 5. CO5: (Remember ) Gain the knowledge of different media streams in multimedia transmissions. |
| 49 | | U19CS304 | MACHINE LEARNING | 1. CO1: (Understand) Understand the basic concepts of Machine Learning |
| | | | | 2. CO2: (Understand) Understand the concepts behind supervised learning and their appropriateness |
| | | | | 3. CO3: (Understand) Understand the concepts behind unsupervised learning and their appropriateness |
| | | | | 4. CO4: (Apply) Choose and apply appropriate graphical model for a given real world problem |
| | | | | 5. CO5: (Apply) Identify applications suitable for different types of machine learning with suitable justification. |
| 50 | | U19IT305 | CLOUD COMPUTING | 1. CO1: (Understand) Interpret the various components of cloud computing based on its business perspective. |
| | | | | 2. CO2: (Understand) Demonstrate the various services that are offered in cloud computing. |
| | | | | 3. CO3: (Apply) Develop various applications using various clouds technology such as Hypervisors, Virtualization, and Multitenant software. |
| | | | | 4. CO4: (Understand) Summarize how Virtualization can solve the problems of distributing a CPU among virtual machines. |
| | | | | 5. CO5: (Apply) Apply the security models during the deployment of applications on the cloud. |
| 51 | | U19CS312 | MACHINE LEARNING LABORATORY | 1. CO1: (Apply) Understand the implementation procedures for the machine learning algorithms |
| | | | | 2. CO2: (Apply) Design Java/Python programs for various Learning algorithms. |
| | | | | 3. CO3: (Apply) Apply appropriate data sets to the Machine Learning algorithms |
| | | | | 4. CO4: (Apply) Apply supervised Learning algorithms to solve real world problems |
| | | | | 5. CO5: (Apply) Apply unsupervised Learning algorithms to solve real world problems |
| 52 | | U19IT313 | CLOUD COMPUTING LABORATORY | 1. CO1: (Apply) Configure various virtualization tools such as Virtual Box, VMware workstation. |
| | | | | 2. CO2: (Apply) Design and deploy a web application in a cloud environment. |
| | | | | 3. CO3: (Apply) Learn CloudSim to simulate a cloud environment to implement new schedulers. |
| | | | | 4. CO4: (Apply) Install and use a generic cloud environment that can be used as a private cloud |
| | | | | 5. CO5: (Apply) Demonstrate the use of Map and Reduce tasks |
| 53 | **Semester VI Professional Elective II** | U19CS503 | DATA ANALYTICS | 1. CO1: (Understand) Understand the concepts of Data science and Analytics |
| | | | | 2. CO2: (Apply) Apply the Preprocessing and Visualization in applications |
| | | | | 3. CO3: (Apply) Implement the learning concepts and Machine Models |
| | | | | 4. CO4: (Apply) Apply the classification and clustering ideas in applications |
| | | | | 5. CO5: (Apply) Apply the system architecture in case studies |
| 54 | | U19CS504 | COMPUTER VISION | 1. CO1: (Understand) Understand the concepts of Recognition Methodology |
| | | | | 2. CO2: (Apply) Implement the concepts of segmentation for binary Image |
| | | | | 3. CO3: (Apply) Implement the concepts of Area extraction and region Analysis for binary Image |
| | | | | 4. CO4: (Understand) Understand the various object Model |
| | | | | 5. CO5: (Apply) Known about the general frameworks and knowledge based vision |

| Sl No. | Year & Semester | Course Code | Course Name | Course Outcome |
|---|---|---|---|---|
| 55 | | U19CS513 | ADVANCED DATA STRUCTURES AND ALGORITHMS | 1. CO1: (Understand) Understand algorithm analysing techniques and asymptotic notation. |
| | | | | 2. CO2: (Understand) Understand various sorting Technique. |
| | | | | 3. CO3: (Understand) Understand elementary data structures. |
| | | | | 4. CO4: (Understand) Understand various advance data structures. |
| | | | | 5. CO5: (Understand) Understand advanced algorithm design technique. |
| 56 | | U19CS514 | R PROGRAMMING | 1. CO1: (Understand) Understanding the basics of R Programming |
| | | | | 2. CO2: (Apply) Apply functions to visualize the data |
| | | | | 3. CO3: (Understand) understanding the concept for data visualization and statistics and probability |
| | | | | 4. CO4: (Analyze) Analysing the data and create the data modelling. |
| | | | | 5. CO5: (Apply) Create the custom plotting graph. |
| 57 | Semester VI Professional Elective II | U19IT502 | SOFTWARE TESTING | 1. CO1: (Understand) Understand all the activities, process and techniques carried out in testing process. |
| | | | | 2. CO2: (Understand) Understand how to prepare test planning based on the test document. |
| | | | | 3. CO3: (Apply) Identify all the testing levels carried out during the testing phase of a software |
| | | | | 4. CO4: (Understand) Understand the testing policies and the activities of specialized testing for object-oriented systems. |
| | | | | 5. CO5: (Apply) Apply the process of automation testing approach and different test suites for software. |
| 58 | | U19IT510 | ADHOC SENSOR NETWORK | 1. CO1: (Understand) Understand the fundamentals of wireless sensor networks and its application to critical real time scenarios. |
| | | | | 2. CO2: (Understand) Learn the different types of MAC protocols. |
| | | | | 3. CO3: (Understand) Be exposing to the TCP issues in ad hoc networks. |
| | | | | 4. CO4: (Understand) Be familiar with different types of ad hoc routing protocols. |
| | | | | 5. CO5: (Apply) Apply the Quality and Energy Management in building WSN network. |
| 59 | | U19IT511 | INFORMATION SECURITY | 1. CO1: (Understand) Discuss the basics of information security |
| | | | | 2. CO2: (Understand) Illustrate the legal, ethical and professional issues in information security |
| | | | | 3. CO3: (Apply) Demonstrate the various aspects in data security |
| | | | | 4. CO4: (Understand) Explain various standards in the Information Security System |
| | | | | 5. CO5: (Apply) Design and implementation of security techniques |
| 60 | | U19IT519 | INFORMATION STORAGE MANAGEMENT | 1. CO1: (Understand) Understand the logical and physical components of a Storage infrastructure. |
| | | | | 2. CO2: (Analyze) Evaluate storage architectures, including storage subsystems, DAS, SAN, NAS, and CAS. |
| | | | | 3. CO3: (Understand) Understand the various forms and types of Storage Virtualization. |
| | | | | 4. CO4: (Understand) Describe the different role in providing disaster recovery and business continuity capabilities. |
| | | | | 5. CO5: (Understand) Distinguish different remote replication technologies. |
| 61 | | U19HS111 | BUSINESS ENGLISH | 1. CO1: (Apply) Apply different conversation techniques in day to day communication |
| | | | | 2. CO2: (Apply) Practice effective listening techniques during conversations. |
| | | | | 3. CO3: (Apply) Develop good reading practice |
| | | | | 4. CO4: (Apply) Report ideas and concepts in an effective manner |
| | | | | 5. CO5: (Apply) Articulate effectively during discussions and presentations |
| 62 | Language Electives | U19HS112 | BASIC JAPANESE | 1. CO1: (Understand) Recognize and write Japanese alphabet |
| | | | | 2. CO2: (Understand) Speak using basic sounds of the Japanese language |
| | | | | 3. CO3: (Apply) Apply appropriate vocabulary needed for simple conversation in Japanese language |
| | | | | 4. CO4: (Apply) Apply appropriate grammar to write and speak in Japanese language |
| | | | | 5. CO5: (Apply) Comprehend the conversation and give correct meaning |
| 63 | | U19HS113 | BASIC GERMAN | 1. CO1: (Understand) Recognize and write German alphabet |
| | | | | 2. CO2: (Understand) Speak using basic sounds of the German language |
| | | | | 3. CO3: (Apply) Apply appropriate vocabulary needed for simple conversation in German language |
| | | | | 4. CO4: (Apply) Apply appropriate grammar to write and speak in German language |
| | | | | 5. CO5: (Apply) Comprehend the conversation and give correct meaning |

| Sl No. | Year & Semester | Course Code | Course Name | Course Outcome |
|---|---|---|---|---|
| 64 | | U19IC301 | ETHICAL HACKING | 1. CO1: (Apply) Install, configure, use and manage hacking software on a closed network environment |
| | | | | 2. CO2: (Apply) Identify tools and techniques to carry out a penetration testing. |
| | | | | 3. CO3: (Apply) Assess an environment using foot printing. |
| 65 | | U19IC302 | Introduction to PAAS | 1. CO1: (Understand) Understand basics of Salesforce |
| | | | | 2. CO2: (Apply) Experiment with SFDC administration and customization |
| | | | | 3. CO3: (Understand) Understand SFDC security |
| 66 | | U19IC303 | ANGULAR JS | 1. CO1: (Apply) Understand and apply the concepts of object oriented Angular scripting languages. |
| | | | | 2. CO2: (Apply)Identify and apply Angular Components. |
| | | | | 3. CO3: (Apply) Apply concepts of Angular Derivatives. |
| 67 | | U19IC304 | TENSORFLOW | 1. CO1: (Apply) Apply the basic concepts of data manipulation |
| | | | | 2. CO2: (Apply) Experiment with various tensor Operations and Functions |
| | | | | 3. CO3: (Apply) Make use of the Classification techniques |
| 68 | Industry Oriented Courses | U19IC305 | GROOVY ON GRAILS | 1. CO1: (Understand) Work with Groovy strings, closures, and collections |
| | | | | 2. CO2: (Apply) Build unit and functional tests for web applications |
| | | | | 3. CO3: (Apply) Select Grails plugins to add functionality |
| 69 | | U19IC306 | KUBERNETES & DOCKER | 1. CO1: (Understand) Understand the basics of Kubernetes |
| | | | | 2. CO2: (Apply) Create Kubernetes clusters and deploy it |
| | | | | 3. CO3: (Understand) Understand services and scheduling |
| 70 | | U19IC307 | REACT | 1. CO1: (Apply) Understand and apply the concepts of React scripting languages. |
| | | | | 2. CO2: (Apply) Identify lifecycle and apply React Components. |
| | | | | 3. CO3: (Apply) Apply concepts of event and SASS |
| 71 | | U19IC308 | JAVA Frameworks | 1. CO1: (Apply) Determine the object-oriented programming concepts |
| | | | | 2. CO2: (Apply) Simulate the mathematical functionality with the help of operators |
| | | | | 3. CO3: (Apply) Develop Web applications using Framework |
| 72 | | U19IC311 | INTRODUCTION TO NETWORK ADMINISTRATION | 1. CO1: (Apply) Determine the division of network functionalities into layers |
| | | | | 2. CO2: (Apply) Experiment about the connection techniques and their configurations |
| | | | | 3. CO3: (Apply) Experiment about the WAN and infrastructure services |