

Department of Computer Science and Engineering

List of Course Outcomes for 2019 Regulation

Sl No.	Year & Semester	Course Code	Course Name	Course Outcome
1	1 st Year and 1 st 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	

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9	1 st Year and 1 st Semester	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
10	1 st Year and 2 nd Semester	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		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
13		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
14		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
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		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

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17	1 st Year and 2 nd Semester	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
18		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.
19		U19PH201	PHYSICS FOR INFORMATION SCIENCE	1. CO1: (Understand) Understand the basics of crystals, their structures and different crystal growth techniques.
				2. CO2: (Apply) Identify and solve problems concerning physical parameters related to electrical and superconductivity in different situations.
				3. CO3: (Understand) Acquire knowledge on basics of semiconductor physics and its applications in various devices.
				4. CO4: (Understand) Gain knowledge on magnetic properties of materials and their suitability in engineering applications.
				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.
				2. CO2: (Apply) Apply recursion on specific applications.
				3. CO3: (Understand) Understand the various tree data structures for efficient storage and retrieval of data.
				4. CO4: (Apply) Employ graph data structure for solving real world problems.
				5. CO5: (Apply) Apply suitable methods for efficient data access through hashing.
21	2 nd Year and 3 rd Semester	U19CS202	DATABASE MANAGEMENT SYSTEMS	1. CO1: (Apply) Use fundamentals of data models and depict a database system
				2. CO2: (Apply) Implement relational databases for various business requirements.
				3. CO3: (Apply) Analyse and implement the properties of database.
				4. CO4: (Apply) Use the application technology for various evaluation techniques and recovery process in database storage.
				5. CO5: (Apply) Use non-structured database systems in application development.
22		U19CS203	OBJECT ORIENTED PROGRAMMING	1. CO1: (Apply) Understand and apply the features of object oriented programming paradigm and Java Semantics
				2. CO2: (Apply) Identify and apply appropriate object oriented concepts of java in problem solving by adhering to Java Coding standards
				3. CO3: (Apply) Apply concepts of java collections API for the given scenario
				4. CO4: (Apply) Apply multithreading concepts in concurrent application development
				5. CO5: (Apply) Use relevant exception-handling mechanisms to ensure uninterrupted flow of application.
23		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.
24		U19CS211	DATA STRUCTURES LABORATORY	1. CO1: (Apply) Apply linear data structures to solve problems.
				2. CO2: (Apply) Implement the concept of trees and graphs using non-linear data structures.
				3. CO3: (Apply) Select suitable tree algorithms for efficient data storage and retrieval with better time complexity.
				4. CO4: (Apply) Apply linear and non-linear data structure and develop a real time software application.
				5. CO5: (Apply) Apply the different hashing data structure for efficient data storage.

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25	2 nd Year and 3 rd Semester	U19CS212	DATABASE MANAGEMENT SYSTEMS LABORATORY	1. CO1: (Apply) Develop ER model for the given problem.
				2. CO2: (Apply) Apply appropriate SQL constraints to a business case.
26	2 nd Year and 3 rd Semester	U19CS213	OBJECT ORIENTED PROGRAMMING LABORATORY	3. CO3: (Apply) Utilize relational database using simple and complex queries in Structured Query Language (SQL).
				4. CO4: (Apply) Formulate procedural language queries (PL/SQL) to the given scenario.
27	2 nd Year and 3 rd Semester	U19MA206	PROBABILITY AND STATISTICS	5. CO5: (Apply) Apply database connectivity concepts in an application development scenario.
				1. CO1: (Apply) Use JRE, JDK and Java-IDE's
28	2 nd Year and 3 rd Semester	U19CS204	OPERATING SYSTEMS	2. CO2: (Apply) Select the required Object oriented mechanism
				3. CO3: (Apply) Use relevant exception-handling mechanisms exception
29	2 nd Year and 3 rd Semester	U19IT201	SOFTWARE ENGINEERING	4. CO4: (Apply) Model the real world problems for efficient outcomes using concurrency concepts
				5. CO5: (Apply) Apply concepts of java collections API for the given scenario
30	2 nd Year and 4 th Semester	U19CS205	DESIGN AND ANALYSIS OF ALGORITHMS	1. CO1: (Apply) Apply the basic probability concepts for random variables and random experiments.
				2. CO2: (Analyze) Analyze various standard distributions applicable to engineering which can describe real life phenomenon.
31	2 nd Year and 4 th Semester	U19MC202	INDIAN CONSTITUTION AND TRADITION	3. CO3: (Analyze) Analyze the functions of two dimensional random variables through its probability values.
				4. CO4: (Apply) Apply statistical tests in testing of hypothesis.
32	2 nd Year and 4 th Semester	U19CS214	OPERATING SYSTEMS LABORATORY	5. CO5: (Analyze) Estimate the values of parameters based on measured empirical data that has a random component.
				1. CO1: (Understand) Use the appropriate concepts of operating system for resource utilization
33	2 nd Year and 4 th Semester	U19CS204	OPERATING SYSTEMS	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
34	2 nd Year and 4 th Semester	U19IT201	SOFTWARE ENGINEERING	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
35	2 nd Year and 4 th Semester	U19CS205	DESIGN AND ANALYSIS OF ALGORITHMS	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.
36	2 nd Year and 4 th Semester	U19MC202	INDIAN CONSTITUTION AND TRADITION	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.
37	2 nd Year and 4 th Semester	U19CS214	OPERATING SYSTEMS LABORATORY	5. CO5: (Apply) Apply the testing principles to software project development.
				1. CO1: (Understand) Estimate the time and space complexities of algorithms.
38	2 nd Year and 4 th Semester	U19CS205	DESIGN AND ANALYSIS OF ALGORITHMS	2. CO2: (Apply) Apply algorithm analysis techniques for a given algorithms.
				3. CO3: (Analyze) Analyse different algorithms for solving a given problem.
39	2 nd Year and 4 th Semester	U19MC202	INDIAN CONSTITUTION AND TRADITION	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.
40	2 nd Year and 4 th Semester	U19MC202	INDIAN CONSTITUTION AND TRADITION	1. CO1: (Understand) Understand the characteristics of the Constitution of India
				2. CO2: (Understand) Understand the fundamental rights and duties
41	2 nd Year and 4 th Semester	U19CS214	OPERATING SYSTEMS LABORATORY	3. CO3: (Understand) Understand the federal structure and distribution of legislative and financial powers
				4. CO4: (Understand) Understand the constitutional amendments and emergency provisions
42	2 nd Year and 4 th Semester	U19CS214	OPERATING SYSTEMS LABORATORY	5. CO5: (Understand) Understand the fundamental right to equality, freedom, life and personal freedom
				1. CO1: (Apply) Use different LINUX commands and implement shell programming.
43	2 nd Year and 4 th Semester	U19CS214	OPERATING SYSTEMS LABORATORY	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.
44	2 nd Year and 4 th Semester	U19CS214	OPERATING SYSTEMS LABORATORY	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.

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33	2 nd Year and 4 th Semester	U19IT211	SOFTWARE ENGINEERING LABORATORY	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.
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		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		U19CS301	INTERNET PROGRAMMING	1. CO1: (Understand) Explain the history of the internet and related internet concepts
				2. CO2: (Apply) Create basic website using HTML and CSS
				3. CO3: (Apply) Design and implement server side programs using Servlets and JSP
				4. CO4: (Understand) Describe the representation of data using XML Technology
				5. CO5 : (Understand) Demonstrate the working of MVC pattern using Spring, Hibernate and Maven Technologies
37	3 rd Year and 5 th 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		U19CS311	INTERNET PROGRAMMING LABORATORY	1. CO1: (Apply) Use Cascading style sheets to implement a variety of presentation effects in HTML including explicit positioning of elements
				2. CO2: (Apply) Create dynamic web pages by incorporating java script in HTML
				3. CO3: (Apply) Develop interactive web pages using server side programming languages
				4. CO4: (Apply) Construct web pages using XML
				5. CO5: (Apply) Design web pages using web services
40		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.

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41		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	Professional Elective I	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
46		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		U19CS303	AUTOMATA THEORY AND COMPILER DESIGN	1. CO1: (Apply) Construct automata, regular expression for any pattern.
				2. CO2: (Apply) Design Turing Machines for any Language
				3. CO3: (Understand) Understand the different phases of compiler.
				4. CO4: (Apply) Apply different parsing algorithms to develop the parsers for a given grammar.
				5. CO5: (Understand) Learn to implement code optimization techniques and a simple code generator.
48	3 rd Year and 6 th Semester	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.



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49	3 rd Year and 6 th Semester	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		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
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	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
53		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
54		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.
55	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.	
56	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 an 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.	

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57	Professional Elective II	U19IT510	AD HOC 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.
58		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
59	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	
60	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	
61	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	
62	Industry Oriented Course	U19IC301	ETHICAL HACKING	1. CO1: (Apply) Install, configure, use and manage hacking software on a closed network environment
63		U19IC302	Introduction to PAAS	2. CO2: (Apply) Identify tools and techniques to carry out a penetration testing.
				3. CO3: (Apply) Assess an environment using foot printing.
				1. CO1: (Understand) Understand basics of Salesforce
64		U19IC303	ANGULAR JS	2. CO2: (Apply) Identify and apply Angular Components.
				3. CO3: (Apply) Apply concepts of Angular Derivatives.
				1. CO1: (Apply) Apply the basic concepts of data manipulation
65		U19IC304	TENSORFLOW	2. CO2: (Apply) Experiment with various tensor Operations and Functions
				3. CO3: (Apply) Make use of the Classification techniques
				66
2. CO2: (Apply) Build unit and functional tests for web applications				
3. CO3: (Apply) Select Grails plugins to add functionality				



Sl No.	Year & Semester	Course Code	Course Name	Course Outcome
67	Industry Oriented Course	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
68		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			
69	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	
70		U19IC309	CLOUD COMPUTING	1. CO1: (Understand) Understand the basic concepts of Cloud Computing
				2. CO2: (Apply) Apply Storage and Networking Concepts in Cloud.
	3. CO3: (Apply) Apply Scaling and Security in clouds			
71	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	