

Department of Artificial Intelligence and Data Science

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		U19MA104	LINEAR ALGEBRA	1. CO1: (Apply) Apply basic concepts of Matrix method to solve linear equations.
				2. CO2: (Apply) Apply analytical concepts and numerical methods of matrix to solve linear equations and basic applications in Image Processing and Machine Learning using the concepts of Singular value decomposition and Principal component analysis.
				3. CO3: (Apply) Understanding the concepts of vector space and its properties to solve engineering problems.
				4. CO4: (Analyze) Analyze the characteristics of a linear system with Eigen values and vectors.
				5. CO5: (Analyze) Analyze the systems by vector space techniques.
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	1st Year and 2nd Semester	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		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
17		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

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18	2 nd Year and 3 rd 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.
19		U19AD201	FOUNDATIONS OF ARTIFICIAL INTELLIGENCE	1. CO1: (Understand) Understand the basics of Artificial Intelligence 2. CO2: (Understand) Develop fundamental understanding of different problem solving methods and search strategies 3. CO3: (Apply) Apply Knowledge Representation in Knowledge based systems 4. CO4: (Apply) Demonstrate ideas behind software agents to solve a problem 5. CO5: (Apply) Design applications for NLP that use Artificial Intelligence
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		U19CSPC202	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.
25		U19CSLC202	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. 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. 5. CO5: (Apply) Apply database connectivity concepts in an application development scenario.

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26	2 nd Year and 3 rd Semester	U19CS213	OBJECT ORIENTED PROGRAMMING LABORATORY	1. CO1: (Apply) Use JRE, JDK and Java-IDE's
				2. CO2: (Apply) Select the required Object oriented mechanism
				3. CO3: (Apply) Use relevant exception-handling mechanisms exception
				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
27	2 nd Year and 4 th Semester	U19MA206	PROBABILITY AND STATISTICS	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.
				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.
				5. CO5: (Analyze) Estimate the values of parameters based on measured empirical data that has a random component.
28	2 nd Year and 4 th Semester	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: (Analyze) 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.
29	2 nd Year and 4 th Semester	U19AD202	INTRODUCTION TO DATA SCIENCE	1. CO1: (Understand) Understand and master the fundamentals of Data Science
				2. CO2: (Apply) Experiment with various data collection and exploration techniques
				3. CO3: (Understand) Understand the basic concepts of data analysis
				4. CO4: (Apply) Build and Make use of evaluation and visualization models
				5. CO5: (Apply) Implement typical unsupervised learning algorithms for different types of applications
30	2 nd Year and 4 th Semester	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.
31	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
				3. CO3: (Understand) Understand the federal structure and distribution of legislative and financial powers
				4. CO4: (Understand) Understand the constitutional amendments and emergency provisions
				5. CO5: (Understand) Understand the fundamental right to equality, freedom, life and personal freedom
32	2 nd Year and 4 th Semester	U19AD211	DATA SCIENCE LABORATORY	1. CO1: (Understand) Understand and master the fundamentals of Data Science
				2. CO2: (Understand) Understand the basics of Numpy for computations
				3. CO3: (Apply) Make use of pandas for various data manipulations
				4. CO4: (Apply) Experiment visualizations with Matplotlib Library
				5. CO5: (Apply) Apply the machine Learning Algorithms to various datasets
33	2 nd Year and 4 th Semester	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.
34	2 nd Year and 4 th Semester	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.

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35	Language Electives	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
36		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
37		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
38	Industry Oriented Courses	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.				
2. CO3: (Apply) Assess an environment using foot printing.				
39		U19IC302	INTRODUCTION TO PAS	1. CO1: (Understand) Understand basics ofSalesforce
2. CO2: (Apply) Experiment with SFDC administration and customization				
2. CO3: (Understand) Understand SFDC security				
40		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.				
2. CO3: (Apply) Apply concepts of Angular Derivatives.				
41		U19IC304	TENSOR FLOW	1. CO1: (Apply) Apply the basic concepts of data manipulation
2. CO2: (Apply) Experiment with various tensor Operations and Functions				
2. CO3: (Apply) Make use of the Classification techniques				
42		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				
2. CO3: (Apply) Select Grails plugins to add functionality				
43	U19IC306	KUBERNETES & DOCKER	1. CO1: (Understand) Understand the basics of Kubernetes	
2. CO2: (Apply) Create Kubernetes clusters and deploy it				
2. CO3: (Understand) Understand services and scheduling				
44	U19IC307	REACT	1. CO1: (Apply) Understand and apply the concepts of React scripting languages.	
2. CO2: (Apply) Identify lifecycle and apply React Components.				
2. CO3: (Apply) Apply concepts of event and SASS.				
45	U19IC308	JAVA FRAMEWORKS	1. CO1: (Apply) Determine the object oriented programming concepts	
2. CO2: (Apply) Simulate the mathematical functionality with the help of operators				
2. CO3: (Apply) Develop Web applications using Framework				
46	U19IC309	CLOUD COMPUTING	1. CO1: (Apply) Understand the basic concepts of Cloud Computing	
2. CO2: (Apply) Apply Storage and Networking Concepts in Cloud.				
2. CO3: (Apply) Apply Scaling and Security in clouds				
47	U19IC310	R PROGRAMMING	1. CO1: (Understand) Install and setup R studio environment and understand foundational R programming concepts.	
2. CO2: (Understand) Understand the control structures and create user defined functions for mathematical and other logical operations.				
2. CO3: (Understand) Understand the debugging tool and Use loop constructs and recursion.				



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48	Industry Oriented Courses	U19IC312	COMPUTER NETWORK AND APPLICATION	1. CO1: (Apply) Use the theoretical skills in network applications development into practice and design internet socket programming.
				2. CO2: (Understand) Demonstrate the relevant components and tools of modern networks.
				2. CO3: (Analyze) Analyze the requirements for a given organizational structure and select the appropriate networking architecture and technologies.
49	Industry Oriented Courses	U19IC701	EDGE COMPUTING AND ANOMALY DETECTION	1. CO1: (Understand) Understand the basic concepts of edge computing.
				2. CO2: (Understand) Understand the edge computing deployment.
				2. CO3: (Understand) Gain knowledge on edge computing standards and anomaly detection.