

## Department of Computer Science and Business System

### List of Course Outcomes for 2019 Regulation

<b>SI No.</b>	<b>Year &amp; Semester</b>	<b>Course Code</b>	<b>Course Name</b>	<b>Course Outcome</b>
1	1 <sup>st</sup> Year and 1 <sup>st</sup> Semester	U19HS102	BUSINESS COMMUNICATION AND VALUE SCIENCE I	1. CO1: (Remember) Remember the need for life skills and values
				2. CO2: (Understand) Recognize own strengths and opportunities
				3. CO3: (Apply) Apply the life skills to different situations.
				4. CO4: (Understand) Understand the basic tenets of communication.
				5. CO5: (Apply) Apply the basic communication practices in different types of communication
2		U19MA103	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 principle to solve mathematical statements
				3. CO3: (Apply) Apply integrated approach to set theory and Boolean algebra provide a firm basis.
3		U19MA104	LINEAR ALGEBRA	4. CO4: (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
				5. CO5: (Apply) Evaluate the functions to get the surface area and volume using multiple integral.
4		U19PH101	ENGINEERING PHYSICS	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 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.
5		U19CS101	PROBLEM SOLVING USING C	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.
6		U19PH111	PHYSICS LABORATORY	1. CO1: (Understand) Understand appropriate looping and conditional constructs for given problems
				2. CO2: (Understand) Understand pointers, arrays and strings to solve complex problems
7		U19GE111	ENGINEERING PRACTICES LABORATORY	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
				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.
8		U19CS111	PROBLEM SOLVING USING C 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.

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9	1 <sup>st</sup> Year and 1 <sup>st</sup> 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		U19HS103	BUSINESS COMMUNICATION AND VALUE SCIENCE II	1. CO1: (Understand) Understand tools of structured written communication and basics of presentation skills 2. CO2: (Apply) Apply the basic concept of speed reading, skimming and scanning. 3. CO3: (Understand) Understand and identifying the individual personality types and their role in a team along with the concept of morality and diversity. 4. CO4: (Apply) Recognize the concept of outward behavior and internal behavior 5. CO5: (Apply) Organize an event to generate awareness and get support for a cause through communicative ability
11		U19MA105	PROBABILITY AND STATISTICS	1. CO1: (Apply) Apply the basic probability concepts for random variables and random experiments. 2. CO2: (Apply) Apply various standard distributions applicable to engineering which can describe real life phenomenon. 3. CO3: (Apply) Apply the functions of two dimensional random variables through its probability values. 4. CO4: (Apply) Acquire knowledge in descriptive statistics. 5. CO5: (Apply) Apply statistical tests in testing of hypothesis.
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	1 <sup>st</sup> Year and 2 <sup>nd</sup> Semester	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.
14		U19CB101	FUNDAMENTALS OF ECONOMICS	1. CO1: (Apply) Understand basic principles and concepts microeconomics and apply them to solve the business problems 2. CO2: (Apply) Explain the behaviour and performance of an economy of a nation. 3. CO3: (Understand) Understand the concepts of banking and central bank's monetary policy in economic development of a nation.. 4. CO4: (Understand) Understand the behaviour of firms operating in perfect and imperfect competitions. 5. CO5: (Understand) Understand the nuances of planning commission, five year plan and finance commission.
15		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
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		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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18		U19MA208	STATISTICAL MODELLING	1. CO1: (Understand) Classify the sampling techniques. 2. CO2: (Understand) Understand the basic concepts of linear statistical models. 3. CO3: (Understand) Gain familiarity in estimate of statistical data. 4. CO4: (Understand) Expertise in non-parametric methods. 5. CO5: (Apply) Apply knowledge of time series analysis in economics and engineering fields.
19		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.
20		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.
21		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.
22	2 <sup>nd</sup> Year and 3 <sup>rd</sup> 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.
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		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.
25		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
26		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.

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27		U19MA209	COMPUTATIONAL STATISTICS	1. CO1: (Understand) Understand the basic concepts of Statistical techniques and multivariate regression models. 2. CO2: (Understand) Understand the basic concepts of Discriminant analysis and Principal component analysis 3. CO3: (Understand) Understand the concepts of factor analysis and segmentation analysis. 4. CO4: (Apply) Implement Python and Data wrangling techniques in Computational Statistics 5. CO5: (Apply) Interpretation of data aggregation and create visualizations using Python.
28		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
29		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
30		U19CB201	INTRODUCTION TO INNOVATION, IP MANAGEMENT AND ENTREPRENEURSHIP	1. CO1: (Understand) Understand the conceptual knowledge of innovation. 2. CO2: (Understand) Understand the importance of IP. 3. CO3: (Understand) Understand the training models and the management practices. 4. CO4: (Understand) Learn the techniques of entrepreneurship. 5. CO5: (Apply) Implement, evaluate and control the process of entrepreneurship.
31	2 <sup>nd</sup> Year and 4 <sup>th</sup> 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		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.
33		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
34		U19HS201	BUSINESS COMMUNICATION AND VALUE SCIENCE III	1. CO1: (Apply) Identify the best practices of technical writing & apply technical writing in real life scenarios. 2. CO2: (Understand) Apply the basic principles of SWOT & life positions. 3. CO3: (Apply) Respect pluralism in cultural spaces. 4. CO4: (Apply) Identify the common mistakes made in cross-cultural communication. 5. CO5: (Apply) Understand the power of motivation in real life

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35	2 <sup>nd</sup> Year and 4 <sup>th</sup> 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.
36		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
37	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
38		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
39		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.
40		U19IC302	INTRODUCTION TO PAS	1. CO1: (Understand) Understand basics of Salesforce 2. CO2: (Apply) Experiment with SFDC administration and customization 3. CO3: (Understand) Understand SFDC security
41	Industry Oriented Courses	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.
42		U19IC304	TENSOR FLOW	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
43		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

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44	Industry Oriented Courses	U19IC306	KUBERNETES & DOCKER	1. CO1: (Understand) Understand the basics of Kubernetes
45				2. CO2: (Apply) Create Kubernetes clusters and deploy it
46				3. CO3: (Understand) Understand services and scheduling
47		U19IC307	REACT	1. CO1: (Apply) Understand and apply the concepts of React scripting languages.
48				2. CO2: (Apply) Identify lifecycle and apply React Components.
49				3. CO3: (Apply) Apply concepts of event and SASS.
50		U19IC308	JAVA FRAMEWORKS	1. CO1: (Apply) Determine the object oriented programming concepts
51				2. CO2: (Apply) Simulate the mathematical functionality with the help of operators
		U19IC309		3. CO3: (Apply) Develop Web applications using Framework
		CLOUD COMPUTING	1. CO1: (Apply) Understand the basic concepts of Cloud Computing	
			2. CO2: (Apply) Apply Storage and Networking Concepts in Cloud.	
			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.	
			3. CO3: (Analyze) Analyze the requirements for a given organizational structure and select the appropriate networking architecture and technologies.	
		U19IC601	INTRODUCTION TO MOBILE APP DEVELOPMENT	1. CO1: (Apply) Apply the basic concepts of mobile applications
				2. CO2: (Apply) Experiment with android application components
				3. CO3: (Apply) Make use of the Communications Via Network and the Web
		U19IC602	HADOOP	1. CO1: (Understand) Understand the Hadoop architecture and work on Hadoop framework and its ecosystems.
				2. CO2: (Understand) Understand the Big Data Hadoop using Map-reduce programming and CRUD operations in Hadoop framework.
				3. CO3: (Understand) Understand the architecture of HIVE and HIVEQL, HBASE and apply knowledge in various technologies.
		U19IC603	SCALA	1. CO1: (Understand) Understand the fundamentals of Scala
				2. CO2: (Apply) Experiment with Object Orientation in Scala
				3. CO3: (Apply) Implement various programs using List, Array and Maps