SARASWATI Education Society's
SARASWATI College of Engineering
Learn Live Achieve and Contribute
Kharghar, Navi Mumbai - 410 210.

Department-IT ENGINERRING

Scheme R19

Semester-III

Course Code:	ITC301		Course Name	Subject- ENGINERING MATHEMATICS-III		
PO	**PSO**	**Competancy**	**PI**	**Bloom's Level**	**CO**	**Description**
1,2	1	1.6,2.6	1.6.1,2.6.3	3	CO1	Apply the concept of Laplace transforms and use to solve real integrals in engineering problems
2,3	1	2.5,3.5	2.5.2,3.5.6	3,5	CO2	Identify the concept of inverse laplace transform and compare to various functions and its applications
3,4	2	3.5,4.5	3.5.6,4.5.1	3,6	CO3	Develop and determine Fourier series for real life problems and applications.
1,2	1	1.6,2.8	1.6.1,2.8.1	3,4	CO4	Apply the properties of Complex analysis and select the application to orthogonal trajectories.
2,5	1	2.6,5.4	2.6.3,5.4.2	3	CO5	Use the concept of statistical techniques to solve problems in data science,machine learning and AI.
1,2,12	2	1.2,2.8,12.5	1.2.2,2.8.1,12.5.2	3	CO6	Apply the concept of probability,expectation to determine the spread of data and probability distribution.
Course Code:	**ITC302**		**Course Name**	**Subject-Data Structure and Analysis**		
PO	**PSO**	**Competancy**	**PI**	**Bloom's Level**	**CO**	**Description**
1	1,2	1.6	1.6.1	1,2,3	1	Classify and Apply the concepts of stacks, queues and linked list in real life problem solving.
3	1,2	3.6	3.6.2	2,3,4	2	Classify, apply and analyze the concepts trees in real life problem solving
3	1,2	3.6	3.6.2	3,5	3	Illustrate and justify the concepts of graphs in real life problem solving.
1	1,2	1.7	1..7.1	2,3,4	4	List and examine the concepts of sorting, searching techniques in real life problem solving.
2	1,2	2.6	2.6.3	3,4	5	Use and identify the concepts of recursion, hashing in real life problem solving.
2	1,2	2.6	2.6.3	3,4,5	6	Examine and justify different methods of stacks, queues, linked list, trees and graphs to various applications.

Course Code:	ITC303		Course Name	Subject- Database Management System		
PO	**PSO**	**Competancy**	**PI**	**Bloom's Level**	**CO**	**Description**
PO2	1	2.5	2.5.2	L1,L2	1	Identify the need of Database Management System.
PO3	2	3.8	3.8.2	L6	2	Design conceptual model for real life applications
PO2	1	2.8	2.8.1	L6	3	Create Relational Model for real life applications
PO2	1	2.7	2.7.2	L3	4	Formulate query using SQL commands.
PO1	1	1.7	1.7.1	L3	5	Apply the concept of normalization to relational database design
PO2	1	2.5	2.5.2	L2	6	Demonstrate the concept of transaction, concurrency and recovery
Course Code:	**ITC 304**		**Subject- Principle of Communication**			
PO	**PSO**	**Competancy**	**PI**	**Bloom's Level**	**CO**	**Description**
PO1		1.6	1.6.1	L3	CO1	Apply basic engineering fundamentals to explain the basics of Analog and Digital Communication Systems.
PO2		2.6	2.6.4	L2	CO1	Compare and contrast between Analog and Digital Communication Systems to select best communication system as per application.
PO1		1.6	1.6.1	L2	CO2	Apply engineering fundamentals to differentiate types of noise.
PO1		1.2	1.2.1	L3	CO2	Apply the knowledge of friiss formula to solve problems.
PO2		2.8	2.8.2	4	CO3	Analyses the Fourier transform of time and frequency domain and interpret the result.
PO1		1.6	1.6.1	L3	CO3	Apply engineering fundamentals to explain Amplitude and Frequency modulation techniques.
PO1		1.6	1.6.1	L3	CO3	Apply engineering fundamentals to sketch Transmitter and receiver of AM, DSB, SSB and FM.
PO1		1.6	1.6.1	L3	CO4	Apply engineering fundamentals to explain Pulse analog and digital modulation techniques.
PO2		2.6	2.6.4	L2	CO4	Compare and contrast between Pulse digital modulation techniques to select best modulation technique.
PO1		1.6	1.6.1	L3	CO5	Apply engineering fundamentals to explain ASK, FSK, PSK modulation techniques.
PO2		2.6	2.6.4	L2	CO5	Compare and contrast between ASK, FSK, PSK modulation techniques to select best modulation technique.

PO1		1.6	1.6.1	L3	CO6	Apply engineering fundamentals to explain Electromagnetic radiation and propagation.
Course Code:	**ITC305**		**Course Name**	**Subject- Paradigms and Computer Programming Fundamentals**		
PO	**PSO**	**Competancy**	**PI**	**Bloom's Level**	**CO**	**Description**
PO1	1	1.6	1.6.1	Level 4 Analyze	CO1	able to apply knowldge to Compare different programming paradigm
PO1	1	1.6	1.6.1	Level 1Remember	Co2	able to apply knowldge understand the basic concept of object oriented
PO1	1	1.6	1.6.1	Level 1 Remember	CO3	apply knowldge to understand the concepts of declarative programming paradigms through functional and logic programming
PO3		3.8	3.8.2	Level 1Remember	CO4	understnd basic concept of declarative programming paradigm with PROLOG langauge
PO2		2.5	2.5.2	Level 2	CO5	Understand role of concurrency in parallel and distributed programming.
PO2		2.6	2.6.1	Level 2	CO6	Understand the basic of server aside and client side sripting
Course Code:	**ITL301**		**Course Name**	**Subject- Data Structure Lab**		
PO	**PSO**	**Competancy**	**PI**	**Bloom's Level**	**CO**	**Description**
1	1,2	1.6	1.6.1	1,2,3	1	Understand and use the basic concepts and principles of various linked lists, stacks and queues.
3	1,2	3.6	3.6.2	1,2	2	Understand the concepts and apply the methods in basic trees.
3	1,2	3.6	3.6.2	3,4	3	Use and identify the methods in advanced trees.
1	1,2	1.7	1..7.1	2,3	4	Understand the concepts and apply the methods in graphs.
2	1,2	2.6	2.6.3	2,3	5	Understand the concepts and apply the techniques of searching, hashing and sorting
2	1,2	2.6	2.6.3	3,4	6	Illustrate and examine the methods of linked lists, stacks, queues, trees and graphs to various real time problems
Course Code:	**ITL302**		**Course Name**	**Subject- SQL Lab**		
PO	**PSO**	**Competancy**	**PI**	**Bloom's Level**	**CO**	**Description**
3	2	3.5	3.5.1	L1,L3,L4,L6	1	Define problem statement and Construct the conceptual model for real life application.
4	2	4.5	4.5.1	L3,L4	2	Create and populate a RDBMS using SQL.
2	1	2.7	2.7.1	L3.L4	3	Formulate and write SQL queries for efficient information retrieval

2	2	2.8	2.8.1	L1,L3,L4	4	Apply view, triggers and procedures to demonstrate specific event handling.
4	1	4.5	4.5.1	L3	5	Demonstrate database connectivity using JDBC
4	1	4.5	4.5.1	L3,L4	6	Demonstrate the concept of concurrent transactions.
Course Code:	**ITL303**		**Course Name**	**Subject- Computer programming Paradigms Lab**		
PO	**PSO**	**Competancy**	**PI**	**Bloom's Level**	**CO**	**Description**
PO1		1.6	1.6.1	L3	CO1	understand and apply different loops in c++
PO1	1	1.6	1.6.1	L3	CO2	Aply knowldge of Object Oriented concepts in C++ program
PO2	1	2.6	2.6.2	L1	co3	Understand the multithreaded programs in Java and C++ and implement solution for concurrency as solution
PO1	1	1.6	1.6.1	L3	Co4	Aply knowldge use of exception handling and garbage collection in C++ and JAVA
Po3	1	3.7	3.7.1	L6	CO5	Design solution based on declarative programming paradigm using functional and logic programming using Haskell.
PO2		2.6	2.6.4	L5	CO6	Compare the implementations in multiple paradigms at coding and execution level teams

Course Code:	ITL304		Course Name	Subject- Java Lab (SBL)		
PO	**PSO**	**Competancy**	**PI**	**Bloom's Level**	**CO**	**Description**
1	1	1.6.1	1.6	2	CO1	Understand and explain Basic programming concepts
3	1	3.7.1	3.7	3	CO2	Use the basic concepts like class,Objects,methods,Array,String for finding solution to problems.
3	1	3.7.1	3.7	3	CO3	Demonstrate how to use inheritance,interface and packages for development.
3	1	3.8.1	3.8	3	CO4	Use multithreading,exceptional handling and IO streams concepts for better development.
3	2	3.6.2	3.6	6	CO5	Design and Develop GUI using Swing and AWT.
3	2	3.6.2	3.6	6	CO6	Design and Develop GUI using JavaFX.
Course Code:	**ITM301**		**Course Name**	**Subject- Mini Project – 1 A for Front end /backend Application using JAVA**		
PO	**PSO**	**Competancy**	**PI**	**Bloom's Level**	**CO**	**Description**
PO1, PO2	PSO1, PSO2	1.7, 2.5	1.7.1, 2.5.1	L3, L4	CO1	Evaluate, Apply and analyze problem statements based on societal /research needs and identifies objectives to solve an engineering problem in society
PO3, PO5	PSO1, PSO2	3.5, 5.4	3.5.5, 5.4.1	L4, L6	CO2	Explore and synthesize system requirements from larger social and professional concerns and identify modern engineering tools, techniques and resources to produce a variety of potential design solutions
PO4, PO7	PSO1	4.6, 7.4	4.6.2, 7.4.2	L4	CO3	Critically analyze data through theoretical/ experimental/ simulations and describe management techniques to analyze the impact of solutions in societal and environmental for sustainable development
PO6, PO8	PSO1	6.4, 8.3	6.4.1, 8.3.1	L2, L4	CO4	Interpret legislation, regulations, codes, and use standard norms of engineering practices to identify and understand situations of unethical professional conduct and propose ethical alternatives
PO9, PO10	PSO2	9.4, 10.4, 10.5	4.1, 10.4.2, 10.5	L3, L6	CO5	Recognize and develop a variety of interpersonal skills to work as member of a group or leader and Produce well-constructed written engineering documents for publications and deliver effective oral presentations
PO11, PO12	PSO1, PSO2	11.6, 12.4	11.6.2, 12.4.1	L1, L3	CO6	Describe the rationale and Use project management tools to schedule project work leads to lifelong learning for continuing professional development.
Sem-IV						
Course Code:	**ITC401**		**Course Name**	**Subject- ENGINERING MATHEMATICS-IV**		

PO	PSO	Competancy	PI	Bloom's Level	CO	Description
1,2	1	1.7,2.8	1.7.1,2.8.1	3	CO1	Apply the concept of eigen values and eigen vectors in engineering problems
2,4	1	2.8,4.5	2.8.1,4.5.1	3,5	CO2	Use the concepts of Complex integration for evaluating integrals ,computing residues and evaluate various contour integrals.
1,5	1	1.7,5.4	1.7.1,5.4.2	3	CO3	Apply the concept of Z-transformation and inverse in engineering problem.
1,2,12	1	1.7,2.8,12.5	1.7.1,2.8.4,12.5.2	3,2	CO4	Illustrate understanding the concept of probability distribution and sampling theory to engineering problem.
1,4	1	1.7,4.5	1.7.1,4.5.1	3	CO5	Apply the concept of Linear programming problems to optimization.
2,4	1	2.6,4.5	2.6.3,4.5.1	3	CO6	Solve Non linear programming problem for optimization of engineering problem.
Course Code:	**ITC402**		**Course Name**	**Subject- Computer Network and Network Design**		
PO	**PSO**	**Competancy**	**PI**	**Bloom's Level**	**CO**	**Description**
2	1	2.6	2.6.2	L2		Understand the functionality of each layer of communication model
2	1	2.6	2.6.4	L5	CO1	Compare the OSI & TCP/IP Communication Models
1	1	1.6	1.6.1	L4		Categorize the type of Transmission Media
1	1	1.7	1.7.1	L2		Describes Switching techniques
1	1	1.7	1.7.1	L2	CO2	Understand Responsibilities and Protocols of data link layer
2	1	2.8	2.8.2	L4		Analyze the routing protocols
1	1	1.7	1.7.1	L2		Understand IPv4 and IPv6 header Formats
4	1	4.4	4.2.2	L3	CO3	Apply knowledge of IPV4 Addressing to choose a block of IP Address for a Network
1	1	1.7	1.7.1	L2	CO4	Explain data transportation issues and related protocols used for end-to-end data transmission
1	1	1.6	1.6.1	L1		List the data presentation techniques
1	1	1.7	1.7.1	L4	CO5	Illustrate the client server model in application layer protocols
4	2	4.4	4.2.2	L3	CO6	apply the concepts of IP address, Routing and Application service to design a network for an organization

Course Code:	ITC403		Course Name	Subject-Operating System		
PO	**PSO**	**Competancy**	**PI**	**Bloom's Level**	**CO**	**Description**
PO2	PSO1	2.6	2.6.2	L2	CO1	Understand the basic concepts related to Operating System.
PO4	PSO1	4.4	4.4.1	L2	CO2	Describe the process management policies and illustrate scheduling of processes by CPU.
PO3	PSO2	3.6	3.62	L3	CO3	Explain and apply synchronization primitives and evaluate deadlock conditionsas handled by Operating System.
PO4	PSO2	4.5	4.5.1	L4	CO4	Describe and analyze the memory allocation and management functions of Operating System.
PO4	PSO2	4.4	4.4.3	L4	CO5	Analyze and evaluate the services provided by Operating System for storage management.
PO5	PSO1	5.4	5.4.1	L4	CO6	Compare the functions of various special-purpose Operating Systems.
Course Code:	**ITC404**		**Course Name**	**Subject-Automata Theory**		
PO	**PSO**	**Competancy**	**PI**	**Bloom's Level**	**CO**	**Description**
		1.7	1.7.1			Explain, analyze Regular languages, Expression.
1	1,2	3.6	3.6.2	2,4,6	1	Design Regular Grammar, Context Free Grammars.
3	1,2	3.6	3.6.2	6	2	Design different types of Finite Automata and Machines as Acceptor, Verifier and Translator.
3	1,2	2.6	2.6.3	4,6	3	Analyze and design Context Free languages and Grammars.
1	1,2	3.6	3.6.2	6	4	Design different types of Push down Automata as Simple Parser.
2	1,2	3.6	3.6.2	6	5	Design different types of Turing Machines as Acceptor, Verifier, Translator and Basic computing machine
2	1,2	3.6	3.6.2	6	6	Develop understanding of applications of various Automata.
Course Code:	**ITC405**		**Course Name**	**Subject- Computer Organization and Architecture**		
PO	**PSO**	**Competancy**	**PI**	**Bloom's Level**	**CO**	**Description**
PO1	1	1.2	1.2.1	L1	CO1	Apply the knowledge of Number system conversion techniques to solve problems
PO1		1.6	1.6.1	L2	CO1	Apply basic engineering fundamentals to Demonstrate the fundamentals of Digital Logic Design
PO1		1.6	1.6.1	L1	CO2	Apply basic engineering fundamentals to describe and differentiate basic organization of computer, the architecture of 8086 microprocessor and to implement assembly language programming for 8086 microprocessors.

PO2	2	2.6	2.6.4	L2	CO2	Compare and contrast the instructions of 8086 to select appropriate instructions as per given task.
PO2		2.8	2.8.2	L4	CO2	Analyse and interpret the result of ALP using integrated tool.
PO1		1.6	1.6.1	L2	CO3	Apply engineering fundamentals to demonstrate control unit operations and conceptualize instruction level parallelism.
PO1		1.6	1.6.1	L1	CO3	Apply engineering fundamentals to Describe Soft wired (Microprogrammed) and hardwired control unit design methods. Microinstruction sequencing and execution
PO2		2.1	2.5.2	L4	CO4	List and Identify integers and real numbers and perform computer arithmetic operations on integers.
PO2		2.1	2.5.3	L3	CO4	Identify mathematical algorithmic knowledge that applies to solve a given problem
PO1		1.6	1.6.1	L4	CO5	Apply basic engineering fundamentals to Categorize memory organization.
PO2		2.6	2.6.2	L4	CO5	Identify basic functionalities of each element of a memory hierarchy.
PO1		1.6	1.6.1	L3	CO6	Apply basic engineering fundamentals to examine the different methods for computer I/O mechanism.
PO2		2.6	2.6.4	L2	CO6	Compare and contrast alternative methods of data transfer to select the best methods.
Course Code:	**ITL401**		**Course Name**	**Subject-Network Lab**		
PO	**PSO**	**Competancy**	**PI**	**Bloom's Level**	**CO**	**Description**
4	1	4.6	4.6.1	L3	CO1	Demonstratre Basic network administration commands to Investigate network.
3	1	3.6	3.6.2	L2	CO2	Installation and Implementation of network simulator (NS) and Implementsation of TCL scripting.
4	1	4.4	4.4.1	L3	CO3	Understand the network simulator environment. Investigate and examine Network performance
3	2	3.6	3.6.1	L3	CO4	Design and Implement client-server socket Architecture.
1	1	1.7	1.7.1	L4	CO5	Analyse the traffic flow and the contents of protocol frames.
3	2	3.7	3.7.1	L6	CO6	Design and configure a network for an organization.
Course Code:	**ITL 402**		**Course Name**	**Subject- Unix Lab**		
PO	**PSO**	**Competancy**	**PI**	**Bloom's Level**	**CO**	**Description**
PO2	PSO1	2.6	2.6.2	L2	CO1	Understand the architecture and functioning of Unix
PO2	PSO1	2.6	2.6.2	L4	CO2	Identify the Unix general purpose commands
PO4	PSO1	4.6	4.6.1	L3	CO3	Apply Unix commands for system administrative tasks such as file system management and user management.

PO5	PSO2	5.5	5.5.1	L3	CO4	Compute Unix commands for system administrative tasks such as process management and memory management
PO2	PSO2	2.6	2.6.2	L2	CO5	Demonstrate basic shell scripts for different applications.
PO5	PSO2	5.6	5.6.1	L6	CO6	Develop advanced scripts using awk & perl languages and grep, sed, etc. commandsfor performing various tasks.
Course Code:	**ITL403**		**Course Name**	**Subject- Microprocessor Lab**		
PO	**PSO**	**Competancy**	**PI**	**Bloom's Level**	**CO**	**Description**
PO1	1	1.7	1.7.1	L2	CO1	Demonstrate various components and peripheral of computer system
PO1	1	1.2	1.2.1	L4, L6	CO2	Analyze and design combinational circuits
PO4	1	4.5	4.5.1	L3	CO3	Build a program on a microprocessor using arithmetic & logical instruction
PO4	1	4.5	4.5.1	L6	CO4	Develop the assembly level programming using 8086 loop instruction set
PO4	1	4.5	4.5.1	L1	CO5	Write programs based on string and procedure for 8086 microprocessor.
PO5	1	5.4	5.4.1	L6	CO6	Design interfacing of peripheral devices with 8086 microprocessor.
Course Code:	**ITL404**		**Course Name**	**Subject- Python Lab (SBL)**		
PO	**PSO**	**Competancy**	**PI**	**Bloom's Level**	**CO**	**Description**
1	1	1.6.1	1.6	2	CO1	Understand and explain Basic programming concepts
1	1	1.6.1	1.6	2	CO2	Understand and explain Advance data types and function.
3	1	3.7.1	3.7	3	CO3	Use the OOPS concepts for finding solution to problems.
3	1	3.8.1	3.8	3	CO4	Use multithreading,exceptional handling ,modules and packages concepts for better development.
3	2	3.6.2	3.6	6	CO5	Design and develop GUI using tkinter.
4	2	4.6.3	4.6	6	CO6	**Design and develop application using matplotlib,pandas and flask.**
Course Code:	**ITM401**		**Course Name**	**Subject- Mini Project – 1 B for Python based automation projects**		
PO	**PSO**	**Competancy**	**PI**	**Bloom's Level**	**CO**	**Description**

PO1, PO2	PSO1, PSO2	1.7, 2.5	1.7.1, 2.5.1	L3, L4	CO1	Evaluate, Apply and analyze problem statements based on societal /research needs and identifies objectives to solve an engineering problem in society
PO3, PO5	PSO1, PSO2	3.5, 5.4	3.5.5, 5.4.1	L4, L6	CO2	Explore and synthesize system requirements from larger social and professional concerns and identify modern engineering tools, techniques and resources to produce a variety of potential design solutions
PO4, PO7	PSO1	4.6, 7.4	4.6.2, 7.4.2	L4	CO3	Critically analyze data through theoretical/ experimental/ simulations and describe management techniques to analyze the impact of solutions in societal and environmental for sustainable development
PO6, PO8	PSO1	6.4, 8.3	6.4.1, 8.3.1	L2, L4	CO4	Interpret legislation, regulations, codes, and use standard norms of engineering practices to identify and understand situations of unethical professional conduct and propose ethical alternatives
PO9, PO10	PSO2	9.4, 10.4, 10.5	4.1, 10.4.2, 10.5	L3, L6	CO5	Recognize and develop a variety of interpersonal skills to work as member of a group or leader and Produce well-constructed written engineering documents for publications and deliver effective oral presentations
PO11, PO12	PSO1, PSO2	11.6, 12.4	11.6.2, 12.4.1	L1, L3	CO6	Describe the rationale and Use project management tools to schedule project work leads to lifelong learning for continuing professional development.
SEM-V						
Course Code:	**ITC501**		**Course Name**	**Subject- Internet Programming**		
PO	**PSO**	**Competancy**	**PI**	**Bloom's Level**	**CO**	**Description**
PO5	PSO1	5.4	5.4.1	L4	CO1	Identify modern engineering technologies or protocols required for various web applications.
PO4	PSO2	4.4	4.4.3	L3	CO2	Able to choose and apply appropriate JavaScript to add functionality to web pages.
PO2	PSO1	2.6	2.6.4	L5		Compare, contrast and analyze ES6 and ES5 standards
PO4	PSO2	4.5	4.5.1	L6	CO3	Design and develop appropriate front end application using methodologies of basic React
PO3	PSO2	3.6	3.6.2	L7	CO4	Able to produce or design a variety of potential front end application using functional components of React.
PO4	PSO2	4.5	4.5.1	L8	CO5	Design and develop appropriate back-end applications using Node.js
PO3	PSO2	3.8	3.8.2	L9	CO6	Able to implement and integrate web based Node.js applications using Express
Course Code:	**ITC502**		**Course Name**	**Subject- Computer Network Security**		
PO	**PSO**	**Competancy**	**PI**	**Bloom's Level**	**CO**	**Description**
PO1	PSO1	2.5	2.5.1	L2	CO1	Understand security objectives.
PO2	PSO1	1.2	1.2.1	L3		Apply the knowledge of mathematical concepts, matrix and numerical techniques

PO3	PSO1	3.6	3.6.1	L4		Analyse various encryption techniques.
PO1	PSO1	1.7	1.7.1	L2 L3	CO2	Understand and Apply theory and principles of computer science and engineering.
PO3	PSO2	3.6	3.6.2	L6		Design various secure cryptographic applications.
PO5	PSO2	5.4	5.4.2	L2 L6		Create, modify and extend techniques to provide security
PO6	PSO1	6.3	6.3.1	L5		Evaluate various techniques to provide protection of the public.
PO8	PSO1	8.3	8.3.1	L1	CO3	Identify Different types of malicious Software and its effect on the security.
PO3	PSO1	3.5	3.5.5	L3 L6	CO4	Explore design issues and working principles of various secure communication standards including IPsec, and SSL/TLS and email and apply them to provide security for professional concern.
PO5	PSO2	5.4	5.4.2	L3	CO5	Design Network management security architecture and Apply Network Access Control techniques to provide Computer Security.
PO2	PSO1	2.7	2.7.1	L5	CO6	Evaluate the performance and application of firewall and IDS in network security.
Course	**ITC503**		**Course Name**	**Subject-Entrepreneurship and Ebusiness**		
PO	**PSO**	**Competancy**	**PI**	**Bloom's Level**	**CO**	**Description**
PO1	PSO1	1.6	1.6.1	L1, L2	CO1	Apply engineering fundamentals to understand the concept of entrepreneurship and its close relationship with enterprise and owner-management
PO 7	PSO1	7.3	7.3.2	L2	CO1	Understand the relationship between the technical, socio-economic and environmental dimensions of sustainability
PO1	PSO1	1.6	1.6.1	L1, L2	CO2	Apply engineering fundamentals to Understand the nature of business development in the context of existing organizations and of new business start-ups.
PO 10	PSO1	10.4	10.4.1	L1, L2	CO3	Comprehended important factors for starting a new venture and business development.
PO11	PSO1	11.4	11.4.1	L1	CO4	Describe various economic and financial costs/benefits of a business start-up
PO11	PSO1	11.4	11.4.2	L2	CO4	Analyze different forms of financial statements to evaluate the financial status of a business start-up and Know issues and decisions involved in financing and resourcing a business start-up
PO5	PSO1	2.5	2.5.2	L1,L4	CO5	Identify processes/modules/Models of a E-business and Describe various E-business Models and parameters.
PO5	PSO1	5.4	5.4.1	L1	CO6	Identify modern E-business tools, techniques and resources for various E-business
PO5	PSO1	5.4	5.4.2	L2	CO6	Discuss various E-business Strategies and Create/adapt/modify/extend tools and techniques to solve E-business problems.
Course	**ITC504**		**Course Name**	**Subject-Software Engineering**		
PO	**PSO**	**Competancy**	**PI**	**Bloom's Level**	**CO**	**Description**
	PO1		1.6	Level 1 Remember	CO1	Understand the nature of software development life cycle

	PO3	2	3.5	Level 6 Creating	co2	develop software requirement specifications (SRS)
	PO7	2	7.3	Level 6 Creating	CO3	Plan, schedule and track the progress of the projects.
	PO3		**3.7**	**Level 6 Creating**	**CO4**	Understand the design concept and design software solution and user-centric approach and principles of effective user interfaces.
	P07		**7.3**	**Level 6 Creating**	**CO5**	Prepare the RMMM sheet
	PO3	**2**	**3.5**	**Level 3 Apply**	**CO6**	choose testing methods and understanding concept of software quality assurance
Course Code:	ITDLO5012			**Subject- Advance Data Management Technologies**		
PO	**PSO**	**Competancy**	**PI**	**Bloom's Level**	**CO**	**Description**
2	1	2.5	2.5.2	L4	CO1	Analyze query processing and optimization techniques.
6	1	6.3	6.3.1	L2	CO2	Identify and Apply sophisticated access control protocols
2	1	2.5	2.5.2	L2	CO3	identify different models of distributed database system
3	2	3.8	3.8.1	L6	CO4	design datawarehouse system using different OLAP operations
5	1	5.4	5.4.1	L2	CO5	Understand ETL process techniques to extract data from datawarehouse
2	1	2.1	2.5.2	L2	CO6	understand the concept of big data and no sql databases
Course	ITDLO5014		**Course Name**			**Subject- ADS Advanced Data structure and Analysis**
PO	**PSO**	**Competancy**	**PI**	**Bloom's Level**	**CO**	**Description**
1	1,2	1.7	1.7.1	1,2	1	Understand the different methods for analysis of algorithms.
2	1,2	2.6	2.6.3	1,2	2	Choose an appropriate advanced data structure to solve a specific problem.
3	1,2	3.6	3.6.2	1,2,3	3	Apply an appropriate algorithmic design approach for a given problem.
3	1,2	3.6	3.6.2	1,2,3	4	Apply the dynamic programming technique to solve a given problem
3	1,2	3.6	3.6.2	1,2,3	5	Select an appropriate pattern matching algorithm for a given application.
4	1,2	4.5	4.5.1	1,2	6	Understand the concepts of Optimization, Approximation and Parallel computing algorithms.
Course	**ITL501**		**Course Name**	**Subject- IP Lab**		
PO	**PSO**	**Competancy**	**PI**	**Bloom's Level**	**CO**	**Description**
PO2	PSO1	2.6	2.6.2	L4	CO1	Identify functionalities and apply appropriate HTML tags to develop a webpage
PO2	PSO1	3.6	2.6.2	L5	CO2	Identify functionalities and apply CSS tags to format data on webpage
PO3	PSO1	4.6	3.6.2	L6	CO3	Able to understand and produce responsive websites using Bootstrap suited to meet functional requirements.
PO4	PSO2	5.6	4.5.1	L7	CO4	Design and develop interactive web pages using JavaScript

PO3	PSO2	6.6	3.8.2	L8	CO5	Able to construct and implement front end applications using React
PO3	PSO2	7.6	3.8.2	L9	CO6	Able to implement and integrate back end applications using Node.js/Express
Course Code:	**ITL502**		**Course Name**	**Subject- Security Lab**		
PO	**PSO**	**Competancy**	**PI**	**Bloom's Level**	**CO**	**Description**
PO1	PSO1	1.6	1.6.1	L1,L2	CO1	Apply engineering fundamentals to apply the knowledge of symmetric cryptography to implement classical ciphers.
PO2	PSO2	2.5	2.5.3	L1,L2	CO2	Identify mathematical algorithmic knowledge that applies to a given problem to analyze and implement public key encryption algorithms, hashing and digital signature algorithms.
PO5	PSO2	5.4	5.4.2	L1,L2,L3	CO3	Create/adapt/modify/extend tools and techniques to solve engineering problems by exploring the different network reconnaissance tools to gather information about networks
PO5	PSO2	5.4	5.4.2	L1,L2,L3	CO4	Create/adapt/modify/extend tools and techniques to solve engineering problems by Using tools like sniffers, port scanners and other related tools for analyzing packets in a network
PO5	PSO2	5.4	5.4.2	L1,L2,L3	CO5	Identify modern engineering tools, techniques and resources for engineering activities by Using open-source tools to scan the network for vulnerabilities and simulate attacks
PO5	PS02	5.5	5.5.2	L1,L2	CO6	Demonstrate proficiency in using discipline-specific tools by Demonstrating the network security system using open source tools
Course	**ITL503**		**Course Name**	**Subject- DevOPs Lab**		
PO	**PSO**	**Competancy**	**PI**	**Bloom's Level**	**CO**	**Description**
PO4	PSO2	4.4	4.4.3	L1	CO1	Able to choose appropriate devops tools used in software development life cycle
PO3	PSO2	3.8	3.8.2	L2	CO2	Able to select, implement and integrate Git Version Control strategies in the modules.
PO5	PSO1	5.5	5.5.1	L4	CO3	Identify the strengths and limitations of Jenkins tools to Build, Deploy and Test Software Applications
PO2	PSO1	2.6	2.6.3	L4	CO4	Identify and understand the importance of Selenium and Jenkins to test Software Applications
PO2	PSO1	2.8	2.8.2	L4	CO5	Analyze & Illustrate the Containerization of images and deployment of applications over Docker
PO5	PSO2	5.4	5.4.2	L6	CO6	Adapt and integrate Software Configuration Management tool Ansible for provinsing
Course	**ITL504**		**Course Name**	**Subject- Advance DevOPs Lab**		
PO	**PSO**	**Competancy**	**PI**	**Bloom's Level**	**CO**	**Description**
PO2	PSO1	2.6	2.6.3	Level 2 Undestand	CO1	To understand the fundamentals of Cloud Computing and be fully proficient with Cloud based DevOps solution deployment options to meet your business requirements
PO2	PSO2	2.7	2.7.1	Level 6 Create	CO2	To create single and multiple container applications and manage application deployments with rollouts in Kubernetes
PO3	PSO2	3.6	3.6.2	Level 3 Apply	CO3	To apply best practices for managing infrastructure as code environments and use terraform to define and deploy cloud infrastructure.

PO4	PSO2	4.4	4.4.1	Level 4 Analyze	CO4	To identify and remediate application vulnerabilities earlier and help integrate security in the development process using SAST Techniques.
PO4	PSO2	4.6	4.6.4	Level 3 Apply	CO5	To use Continuous Monitoring Tools to resolve any system errors (low memory, unreachable server etc.) before they have any negative impact on the business productivity.
PO5	PSO1	5.4	5.4.1	Level 4 Analyze	CO6	To identify a composition of nano services using AWS Lambda and Step Functions with the Serverless Framework
Course Code:	**ITL505**		**Course Name**	**Subject- Professional Communication & Ethics-II (PCE-II)**		
PO	**PSO**	**Competancy**	**PI**	**Bloom's Level**	**CO**	**Description**
PO 10	PSO1	10.3	10.3.2	Level 2 Undestand	CO-1	To understand and eliminate the barriers of communication and use ability of language skills as lifelong learning in demonstrating advancement of knowledge appropriate to the program.
PO10	PSO1	10.1	10.1.1	Level 6 formulate	CO-2	To formulate the grammatical skills in representing proper, professional documentation needs and allow them to contribute to the advancement of knowledge.
PO10	PSO1	10.2	10.2.2	Level 3 Prepare	CO-3	To prepare the oratory skills and utilize them effectively in a multi disciplinary setting to reach substantial conclusions.
PO10	PSO1	10.3	10.3.1	Level 6 Develop	CO-4	To develop and use efficient techniques for summarization, paraphrasing, interpretation and analysis of data and documents to create, select, apply and to adapt on modern engineering tools.
PO8	PSO1	8.2	8.2.2	Level 2 Express	CO-5	To express and make them understand the writing skills ethically in drafting the technical records and manuals and provide solution to complex open ended engineering problems.
PO9	PSO1	9.3	9.3.2	Level 2 Represent	CO-6	To represent them as team members and leaders with well groomed, organized, social etiquettes in professional and social environment.
Course Code:	**ITM501**		**Course Name**	**Subject- Mini Project – 2 A Web Based Business Model**		
PO	**PSO**	**Competancy**	**PI**	**Bloom's Level**	**CO**	**Description**
PO1, PO2	PSO1, PSO2	1.7, 2.5	1.7.1, 2.5.1	L3, L4	CO-1	Identify problems based on societal /research needs. and Apply Knowledge and skill to solve societal problems in a group.
PO3, PO5	PSO1, PSO2	3.5, 5.4	3.5.5, 5.4.1	L4, L6	CO-2	Develop interpersonal skills to work as member of a group or leader.
PO4, PO7	PSO1	4.6, 7.4	4.6.2, 7.4.2	L4	CO-3	Draw the proper inferences from available results through theoretical/ experimental/simulations and Analyse the impact of solutions in societal and environmental context for sustainable development.
PO6, PO8	PSO1	6.4, 8.3	6.4.1, 8.3.1	L2, L4	CO-4	Use standard norms of engineering practices
PO9, PO10	PSO2	9.4, 10.4, 10.5	4.1, 10.4.2, 10.5	L3, L6	CO-5	Excel in written and oral communication and Demonstrate capabilities of self-learning in a group, which leads to life long learning.
PO11, PO12	PSO1, PSO2	11.6, 12.4	11.6.2, 12.4.1	L1, L3	CO-6	Demonstrate project management principles during project work.
SEM-VI						
Course Code:	ITC601		**Course Name**	**Subject- Data Mining & Business Intelligence Business Model**		
PO	**PSO**	**Competancy**	**PI**	**Bloom's Level**	**CO**	**Description**
2	2	2.6	2.6.3	L2	CO1	Understand the importance of data warehousing and data mining and the principles of BI

4	2	4.6	4.6.1	L2	CO2	Understand and Analyze the data needed for data mining using preprocessing techniques
2	1	2.1	2.5.2	L2	CO3	Understand classification methods and identify algorithm for large data set to predict label
2	1	2.1	2.5.2	L2	CO4	Understand and apply appropriate clustering method on data set to find different patterns
2		2.7	2.7.1	L3	CO5	Apply frequent patterns mining technique and identify its use in market basket analysis
5		5.4	5.4.2	L4	CO6	Apply the appropriate data mining techniques and provide decision support
Course	**ITC602**		**Course Name**	**Subject-Web X.0**		
PO	**PSO**	**Competancy**	**PI**	**Bloom's Level**	**CO**	**Description**
PO2	PSO1	2.6	2.6.2	L1,L2	CO1	Identify and understand the basic functionalities and computing resources related to web analytics and semantic web.
PO2	PSO1	3.6	2.5.2	L1,L3	CO2	Identify and understand how TypeScript can help to eliminate bugs in the code and enable to scale the code.
PO3	PSO2	4.6	3.6.2	L1,L4	CO3	Able to produce or design a variety of potential front end application using AngularJS framework and build dynamic, responsive single-page
PO4	PSO1	5.6	4.6.1	L1,L5	CO4	Use MongoDB for frontend and backend connectivity to collect and analyze data using REST API.
PO4	PSO2	6.6	4.4.3	L1,L6	CO5	Able to choose and apply Flask web development framework to develop web applications with less code.
PO4	PSO2	7.6	4.5.1	L1,L7	CO6	Design and develop Rich Internet Application using proper choice of Framework
Course	**ITC603**		**Course Name**	**Subject- Wireless Technology**		
PO	**PSO**	**Competancy**	**PI**	**Bloom's Level**	**CO**	**Description**
2		2.3	2.3.1	1,2	CO1	Describe the basic concepts of Wireless Network and Wireless Generations.
2	1	2.7	2.7.4	1,2,3,4,5	CO2	Demonstrate and Evaluate the various Wide Area Wireless Technologies.
2	1	2.6	2.6.2	1,2,3,4	CO3	Analyze the prevalent IEEE standards used for implementation of WLAN and WMAN Technologies
4	1	4.7	4.7.1	1,2,3,4,5	CO4	Appraise the importance of WPAN, WSN and Ad-hoc Networks.
5	1	5.4	5.4.1	1,2,3,4	CO5	Analyze various Wireless Network Security Standards.
4		4.7	4.7.2	1,2	CO6	Analyze various Wireless Network Security Standards. L1,L2,L3,L4 6 Review the design considerations for deploying the Wireless Network Infrastructure.
Course	**ITDO6014**		**Course Name**	**Subject- Ethical Hacking and Forensic**		
PO	**PSO**	**Competancy**	**PI**	**Bloom's Level**	**CO**	**Description**
PO3	PSO1	3.5	3.5.1	L1, L2	CO1	Able to define and understand the concept of cybercrime and principles behind ethical hacking.
PO2	PSO1	2.7	2.7.1	L3	CO2	Able to identify the need of digital forensics and apply the concept of digital evidence and incident response.
PO5	PSO1	5.4	5.4.1	L1	CO3	Identify modern engineering tools, techniques and resources for computer forensics
PO4	PSO1	4.6	4.6.1	L6	CO4	Use appropriate procedures, tools and techniques to formulate and collect data and investigate network attacks
PO4	PSO1	4.4	4.4.3	L5	CO5	Able to choose appropriate hardware/software tools to analyze and investigate attacks on mobile platforms.

PO2	PSO1	2.6	2.6.3	L1	CO6	Identify methods to generate legal evidence and supporting investigation reports
Course	ITC604		**Course Name**	**Subject- AI and DS – 1**		
PO	**PSO**	**Competancy**	**PI**	**Bloom's Level**	**CO**	**Description**
3,4	2	3.5 4.5	3.5.1	L2	CO1	Identify sources of Data for mining and perform data exploration for real life applications
4	1	4.6	4.6.1	L2	CO2	Understand the need of data mining algorithms in terms of attributes and class inputs, training, validating, and testing files.
2 , 5	1	2.1 , 5.4	2.5.2 5.4.1	L3	CO3	Demonstate classification method using open source tools like WEKA. Implement appropriate classification algorithm to solve define problem.
2 , 5	1	2.1 , 5.4	2.5.2 5.4.1	L2 L3	CO4	Understand Clustering method using open source tools like WEKA. Implement appropriate clustering algorithm to solve for any application
2 , 5	1	2.1 , 5.4	2.5.2 5.4.1	L3 L6	CO5	Implement association mining on large data sets using open source tools like WEKA. Design any market basket problem
3	2	3.6	3.6.2	L3 L4	CO6	Apply BI to solve practical problems : Analyze the problem domain, use the data collected in enterprise apply the appropriate data mining technique, interpret and visualize the results and provide decision support
Course	ITL601		**Course Name**	**Subject- BI Lab**		
PO	**PSO**	**Competancy**	**PI**	**Bloom's Level**	**CO**	**Description**
3,4	2	3.5 4.5	3.5.1 4.5.1	L2	CO1	Identify sources of Data for mining and perform data exploration for real life applications
4	1	4.6	4.6.1	L2	CO2	Understand the need of data mining algorithms in terms of attributes and class inputs, training, validating, and testing files.
2 , 5	1	2.1 , 5.4	2.5.2 5.4.1	L3	CO3	Demonstate classification method using open source tools like WEKA. Implement appropriate classification algorithm to solve define problem.
2 , 5	1	2.1 , 5.4	2.5.2 5.4.1	L2 L3	CO4	Understand Clustering method using open source tools like WEKA. Implement appropriate clustering algorithm to solve for any application
2 , 5	1	2.1 , 5.4	2.5.2 5.4.1	L3 L6	CO5	Implement association mining on large data sets using open source tools like WEKA. Design any market basket problem
3	2	3.6	3.6.2	L3 L4	CO6	Apply BI to solve practical problems : Analyze the problem domain, use the data collected in enterprise apply the appropriate data mining technique, interpret and visualize the results and provide decision support
Course	**ITL601**		**Course Name**	**Subject- Web Lab**		
PO	**PSO**	**Competancy**	**PI**	**Bloom's Level**	**CO**	**Description**
5	1	5.4	5.4.1	L4,L2	CO1	Identify the open source tools and understand the concepts of Web analytics and Semantic web
3	2	3.6	3.6.1	L6	CO2	Able to design web applications using basic concepts of typescript like inheritance,access modifiers
3	2	3.8	3.8.2	L6	CO3	Able to implement and integrate AngularJS Framework for Single Page Application and apply ng-app,ng-controller,ng-model
3	2	3.8	3.8.2	L6	CO4	Able to Implement and integrate Ajax for Rich Internet Applications for JavaScript and for user validation
3	2	3.6	3.6.2	L6	CO5	Able to create Rest API using MongoDB to build typescript
4	2	4.5	4.5.1	L6	CO6	Design and develop web apps using Flask for Feedback Form and weather app
Course			**Course Name**	**Subject- Sensor Lab (ITL603)**		
PO	**PSO**	**Competancy**	**PI**	**Bloom's Level**	**CO**	**Description**

2	1	2.2	2.2.4	L1,L2	CO1	Differentiate between various wireless communication technologies based on the range of communication, cost, propagation delay, power and throughput.
2	1	2.4	2.4.4	L1,L2	CO2	Conduct a literature survey of sensors used in real world wireless applications.
3	2	3.2	3.2.2	L1,L2,L3	CO3	Demonstrate the simulation of WSN using the Network Simulators (Contiki/Tinker CAD/ Cup carbon etc).
6	2	6.1	6.1.1	L1,L2,L3	CO4	Demonstrate and build the project successfully by hardware/sensor requirements, coding, emulating and testing
8	2	8.1	8.1.1	L1,L2,L3	CO5	Report and present the findings of the study conducted in the preferred domain
9	2	9.1	9.1.2	L1,L2,L3	CO6	Demonstrate the ability to work in teams and manage the conduct of the research study.
Course Code:	**ITL604**		**Course Name**	**Subject-MAD & PWA Lab**		
PO	**PSO**	**Competancy**	**PI**	**Bloom's Level**	**CO**	**Description**
PO4	PSO1	4.5	4.5.1	L1,L2	CO1	Understand cross platform mobile application development using Flutter Framework
PO2	PSO2	2.8	2.8.1,2.8.4	L3	CO2	Design and develop interactive Flutter App by using widgets,layouts,gestures and animation
PO2	PSO2	2.7	2.7.1,2.7.2	L3,L4	CO3	Analyze and build production ready Flutter App by incorporating backend services
PO4	PSO1	4.4	4.4.1	L1,L2	CO4	Understand various PWA frameworks and their requirements
PO2	PSO2	2.8	2.8.1,2.8.4	L3	CO5	Design and develop a responsive user interface by applying PWA design techniques
PO11	PSO2	11.4,11.5	11.4.2,11.5.1	L3,L4	CO6	Develop and Analyse PWA features and deploy it over app hosting solutions
Course	ITL605		**Course Name**	**Subject- DS using Python Lab**		
PO	**PSO**	**Competancy**	**PI**	**Bloom's Level**	**CO**	**Description**
1	1,2	1.7	1.7.1	1	1	Understand the concept of Data science process and associated terminologies to solve real-world problems
2	1,2	2.6	2.6.3	1,2,3,4	2	Analyze the data using different statistical techniques and visualize the outcome using different types of plots.
3	1,2	3.6	3.6.2	1,2,3,4	3	Analyze and apply the supervised machine learning techniques like Classification, Regression or Support Vector Machine on data for building the models of data and solve the problems.
3	1,2	3.6	3.6.2	1,2,3	4	Apply the different unsupervised machine learning algorithms like Clustering, Decision Trees, Random Forests or Association to solve the problems.
2	1,2	2.6	2.6.3	1,2,3,4,5,6	5	Design and Build an application that performs exploratory data analysis using Apache Spark
3	1,2	3.6	3.6.2	1,2,3,4,5,6	6	Design and develop a data science application that can have data acquisition, processing, visualization and statistical analysis methods with supported machine learning technique to solve the real-world problem
Course	**ITM601**		**Course Name**	**Subject- Mini Project – 2 B Based on**		
PO	**PSO**	**Competancy**	**PI**	**Bloom's Level**	**CO**	**Description**
PO2	PSO2	2.5	2.5.1	5	CO1	Evaluate problems based on societal /research needs and apply Knowledge and skill to solve it in a group
PO9	PSO1	9.5	9.5.1	2	CO2	Demonstrate effective communication, problem-solving, conflict resolution and leadership skills to work as member of a group or leader.
PO4	PSO1	4.6	4.6.2	4	CO3	Critically analyze results through theoretical/ experimental/simulations for trends and correlations, stating possible errors and limitations
PO7	PSO1	7.3	7.3.1	4	CO4	Identify and analyse the impacts of solutions in societal and environmental context for sustainable development.

PO10	PSO2	10.5	10.5.2	3	CO5	Deliver effective oral presentations and use standard norms of engineering practices to technical and non-technical audiences
PO12	PSO1	12.5	12.5.2	2	CO-6	Recognize the need and demonstrate capabilities of self-learning in a group to keep current regarding new developments in IT field for life long learning
PO11	PSO1 PSO2	11.5	11.5.1	5	CO-6	Analyze, evaluate and select the most appropriate proposal based on economic and financial considerations and thus demonstrate project management principles during project work.
SEM-VII						
Course	ITC701		**Course Name**	**Subject- AI and DS –II**		
PO	**PSO**	**Competancy**	**PI**	**Bloom's Level**	**CO**	**Description**
3	1,2	3.6	3.6.2	1,2,3	1	Design models for reasoning with uncertainty as well as the use of unreliable information
2	1,2	2.5	2.5.2	1,2,3,4	2	Analyze the process of building a Cognitive application
3	1,2	3.6	3.6.2	1,2,3	3	Design fuzzy controller system.
3	1,2	3.6	3.6.2	1,2,3	4	Apply learning concepts to develop real life applications
4	1,2	4.6	4.6.4	1,2,3,4,5	5	Evaluate performance of learning algorithms
4	1,2	4.5	4.5.1	1,2,3,4	6	Analyze current trends in Data Science.
Course	ITC702 I		**Course Name**	**Subject- Internet of Everything**		
PO	**PSO**	**Competancy**	**PI**	**Bloom's Level**	**CO**	**Description**
PO5	2	5.6	5.6.1	Level 4 Analyze	co1	Discuss Characteristics and Conceptual Framework of IoT
PO4	4	4.6	4.6.1	Level 2 Understand	CO2	Understand the levels of the IoT architectures
PO5	5	5.5	5.5.1	Level 1 Remember	CO3	Identify correlate the connection of smart objects and IoT access technologies
PO4	2	4.6	4.6.1	Level 4 Analyze	CO4	Analyze to Interpret edge to cloud protocols
PO2	2	2.1	2.5.2	Level 1 Remember	CO5	Understand the use of data analytics and data visualization on IoT Data
PO5	2	5.4	5.4.2	Level 6 create	CO6	Evaluate the data and understand how it used in IoT applications
Course	**ITDO7014**		**Course Name**	**Subject- Software Testing and QA**		
PO	**PSO**	**Competancy**	**PI**	**Bloom's Level**	**CO**	**Description**
4	1	4.7	4.7.1	1,2,3	1	Investigate the reason for bugs and analyze the principles in software testing to prevent and remove bugs.
3	2	3.6	3.6.3	1,2	2	Understand various software testing methods and strategies.
5	2	5.6	5.6.2	1,2,3	3	Manage the testing process and testing metrics.
4	2	4.4	4.4.2	1,2	4	Understand fundamental concepts of software automation and use automation
3	2	3.5	3.5.3	1,2,3	5	Apply the software testing techniques in the real time environment.
4	2	4.6	4.6.1	1,2	6	Use practical knowledge of varaiety ways to test software quality and attrributes
Course	ITDO7024		**Course Name**	**Subject- Information Retrieval System**		

PO	PSO	Competancy	PI	Bloom's Level	CO	Description
2	1	2.6	2.6.2	L1	CO1	Define objectives of IRS and differentiate bettween Information Retrieval and Data Retrieval
3	1	3.6	3.6.2	L4,L5	CO2	Evaluate Taxonomy of different Information Retrieval Models.
4	1	4.6	4.6.1	L1,L3	CO3	To solve and process text and multimedia queries and operations .
4	2	4.6	4.6.1	L5 ,L6	CO4	Study and Evaluate document preprocessing and find index for documents.
5	2	5.4	5.4.1	L3	CO5	To use various indexing tools and searching techniques.
3	2	3.8	3.8.3	L3	CO6	Design good user interface for infromation retrival system.
Course	**ILO7016**		**Course Name**	**Subject-Cyber Security and Laws**		
PO	**PSO**	**Competancy**	**PI**	**Bloom's Level**	**CO**	**Description**
PO1	PSO1	1.7	1.7.1	L3, L4	CO1	Apply theory and principles of computer science and engineering to identify different types of cyber crime and its effect on outside world.
PO1	PSO2	1.6	1.6.1	L3	CO2	Apply engineering fundamentals to identify various security challenges in mobile device for different types of attack and Distinguish different aspects of cyber law
PO5	PSO1	5.4	5.4.1	L3 , L4	CO3	Identify and use modern engineering tools and methods in Cyber Security
PO6	PSO1	6.4	6.4.1	L2, L5	CO4	Interpret and assess legislation ,regulation, codes and standards relevant to E-Commerce , The Contract Aspects ,The Security Aspect ,The Intellectual Property Aspect in Cyber Law
PO6	PSO1	6.4	6.4.1	L2, L5	CO5	Interpret and assess legislation ,regulation, codes and standards relevant to cyber law and explain IT act 2000 and its latest amendments .
PO3	PSO2	3.5	3.5.4	L3	CO6	Able to choose appropriate information security standards during software design and development
Course	ITL701		**Course Name**	**Subject- Data Science Lab**		
PO	**PSO**	**Competancy**	**PI**	**Bloom's Level**	**CO**	**Description**
3	1,2	3.6	3.6.2	1,2,3	1	Implement reasoning with uncertainty.
2	1,2	2.5	2.5.2	1,2	2	Explore use cases of Cognitive Computing
3	1,2	3.6	3.6.2	1,2,3	3	Implement a fuzzy controller system.
3	1,2	3.6	3.6.2	1,2,3	4	Develop real life applications using learning concepts.
4	1,2	4.6	4.6.4	1,2,3,4	5	Evaluate performance of applications.
4	1,2	4.5	4.5.1	1,2,3,4,5	6	Implement and analyze applications based on current trends in Data Science.
Course	**ITL702**		**Course Name**	**Subject- IOE Lab**		
PO	**PSO**	**Competancy**	**PI**	**Bloom's Level**	**CO**	**Description**
2	1	2.1	2.1.1	L1,L2	1	Identify the requirements for the real world problems.
4	1	4.1	4.1.1	L1,L2	2	Conduct a survey of several available literatures in the preferred field of study
3	1	3.1	3.1.4	L1,L2,L3	3	Study and enhance software/ hardware skills.
5	2	5.1	5.1.2	L1,L2,L3	4	Demonstrate and build the project successfully by hardware/sensor requirements, coding, emulating and testing.
4	2	4.3	4.3.4	L1,L2,L3,L4	5	To report and present the findings of the study conducted in the preferred domain.
9		9.1	9.1.2	L1,L2,L3,L4	6	Demonstrate an ability to work in teams and manage the conduct of the research study

Course Code:	ITL703		Course Name	Subject- Secure ApplicationDevelopment		
PO	**PSO**	**Competancy**	**PI**	**Bloom's Level**	**CO**	**Description**
PO2	1	2.2	2.2.3	L1	CO1	To understand ,identify a solution for secure programming of application code
PO3	1	3.2	3.2.3	L2	CO2	To understand , assosiate and find alternative design plan of Owasp methodologies and standards
PO4	1,2	4.3	4.3.1	L4	CO3	Understand,Identify and analyse the main vulnerabilities inherent in applications and use tools to conduct experiment .
PO5	1	5.1	5.1.2	L3	CO4	To Understand how techniques such as Data Validation and Authentication can be applied for application
PO5	1,2	5.2	5.2.1	L3	CO5	To understand and apply tools and Security techniques at Session Layer Management.
PO4,PO5	1	4.1	4.1.1, 5.1.1	L3	CO6	Understand how to apply,analyze and create a secure coding for cryptography
Course	**ITL704**		**Course Name**	**Subject-Recent Open SourceProject Lab**		
PO	**PSO**	**Competancy**	**PI**	**Bloom's Level**	**CO**	**Description**
PO1	PSO1, PSO2	1.7	1.7.1	1,2,3	CO1	Understand and apply the basic concepts of Open Source Software.
PO3	PSO1, PSO2	3.5	3.5.3	1,2,3	CO2	Identify the difference between the GPL(General Public Licence) and Contribute to Open Source.
PO6	PSO1	6.4	6.4.1	1,2,3,4,5	CO3	Apply and evaluate your knowledge for the Contribute to Open Source in diffrent operating system
PO7	PSO1	7.4	7.4.1	1,2,3,4,5	CO4	Apply and evaluate your knowledge for the Contribute to Open Source in different Technologies.
PO9, PO10	PSO2	9.4, 10.4, 10.5	4.1, 10.4.2, 10.5	1,2,3,4,5	CO5	Apply and evaluate your knowledge for the Contribute to Open Source in different Network Management..
PO12	PSO1, PSO2	12.4	12.4.1	1,2,3,4,5	CO6	Apply and evaluate your knowledge for the Contribute to Open Source in different Applications and Services.
Course Code:	**ITP701**		**Course Name**	**Subject- Major Project I**		
PO	**PSO**	**Competancy**	**PI**	**Bloom's Level**	**CO**	**Description**
PO1, PO2	PSO1, PSO2	1.7, 2.5	1.7.1, 2.5.1	L3, L4	CO1	Evaluate, Apply and analyze problem statements based on societal /research needs and identifies objectives to solve an engineering problem in society
PO3, PO5	PSO1, PSO2	3.5, 5.4	3.5.5, 5.4.1	L4, L6	CO2	Explore and synthesize system requirements from larger social and professional concerns and identify modern engineering tools, techniques and resources to produce a variety of potential design solutions
PO4, PO7	PSO1	4.6, 7.4	4.6.2, 7.4.2	L4	CO3	Critically analyze data through theoretical/ experimental/ simulations and describe management techniques to analyze the impact of solutions in societal and environmental for sustainable development
PO6, PO8	PSO1	6.4, 8.3	6.4.1, 8.3.1	L2, L4	CO4	Interpret legislation, regulations, codes, and use standard norms of engineering practices to identify and understand situations of unethical professional conduct and propose ethical alternatives
PO9, PO10	PSO2	9.4, 10.4, 10.5	4.1, 10.4.2, 10.5	L3, L6	CO5	Recognize and develop a variety of interpersonal skills to work as member of a group or leader and Produce well-constructed written engineering documents for publications and deliver effective oral presentations
PO11, PO12	PSO1, PSO2	11.6, 12.4	11.6.2, 12.4.1	L1, L3	CO6	Describe the rationale and Use project management tools to schedule project work leads to lifelong learning for continuing professional development.