Course outcomes A. Y. 2023-24
Department-HAS

Subject Name :Engineering Mathematics I	
Subject Code : FEC101	
Course Code : FEC101	
Course Code	**Course Outcomes**
	After the completion of the course the student should be able to
FEC101.1	Illustrate the basic concepts of Complex numbers.
FEC101.2	Apply the knowledge of complex numbersto solve problems in hyperbolic functions and logarithmic function.
FEC101.3	Illustrate the basic principles of Partial differentiation.
FEC101.4	Illustrate the knowledge of Maxima, Minima and Successive differentiation.
FEC101.5	Apply principles of basic operations of matrices, rank and echelon form of matrices to solve simultaneous equations.
FEC101.6	Illustrate SCILAB programming techniques to the solution oflinearand simultaneous algebraic equations.
Subject Name : Engineering Physics-I	
Subject Code : FEC102	
Course Code : FEC102	
FEC102.1	Illustrate the fundamentals of quantum mechanics and its application.
FEC102.2	Apply the X-ray diffraction techniques for exaplining peculiar properties of crystal.
FEC102.3	Illustrate the working of various semiconductor for electronic devices.
FEC102.4	Employ the concepts of interference in thin films for instruments.
FEC102.5	Discuss the properties of Superconductors and Supercapacitors to apply them in novel applications.
FEC102.6	Discuss the properties of engineering materials for their current and futuristic frontier applications.
Subject Name : Engineering Chemistry-I	
Subject Code : FEC103	
Course Code : FEC103	
FEC103.1	Explain the concept of microscopic chemistry in terms of atomic and molecular orbital theory and relate it to diatomic molecules.
FEC103.2	Describe the concept of aromaticity and interpret it with relation to specific aromatic systems.
FEC103.3	Illustrate the knowledge of various types of intermolecular forces and relate it to real gases.
FEC103.4	4. Interpret various phase transformations using thermodynamics.
FEC103.5	Illustrate the knowledge of polymers, fabrication methods, conducting polymers in various industrial fields.
FEC103.6	Analyze the quality of water and suggest suitable methods of treatment.

Subject Name : Engineering Mechanics	
Subject Code : FEC104	
Course Code : FEC104	
FEC104.1	Illustrate the concept of force, moment and apply the same along with the concept of equilibrium in two and three dimensional systems with the help of FBD.
FEC104.2	Locate the centroid and undertand its significance.
FEC104.3	Estimate friction force and required force to overcome friction.
FEC104.4	Analyse relation between velocity and acceleration of a particle by graphical and mathematical methods.
FEC104.5	Analyse types of motions and establish Kinematic relations for a rigid body.
FEC104.6	Analyse the body in motion using force and acceleration, work-energy, impulse-momentum principles
Subject Name : Basic Electrical Engineering	
Subject Code : FEC105	
Course Code : FEC105	
FEC105.1	Evaluate network theorems to determine the circuit response and behavior.
FEC105.2	Evaluate Single-phase Alternating Current circuits.
FEC105.3	Evaluate Three-phase Alternating Current circuits.
FEC105.4	Analyze the performance of single-phase transformer theoretically and graphically.
FEC105.5	Illustrate the working principle of three-phase machines.
FEC105.6	Illustrate the working principle of single-phase machines.
Subject Name : Engineering Physics-I	
Subject Code : FEL101	

Course Code : FEL101	
FEL101.1	Analyze the results based on performance of experiments on interference in thin films.
FEL101.2	Analyze the chracteristics of semicoductor devices based on their experimental performance.
FEL101.3	Verify the theory learned in crystallography.
FEL101.4	Create and design models to address the technical problems and learning life skills.

Subject Name : Engineering Chemistry-I

Subject Code : FEL102

Course Code : FEL102	
FEL102.1	Determine Chloride content
FEL102.2	Determine free acid ph of different solutions
FEL102.3	Determine hardness of water sample
FEL102.4	Synthesize polymers, biodegradable plastics
FEL102.5	Determine Viscosity of oil

Subject Name : Engineering Mechanics

Subject Code : FEL103

Course Code : FEL103	
FEL103.1	Verify equations of equilibrium of coplanar force system
FEL103.2	Verify law of moments.
FEL103.3	Determine the centroid of plane lamina.
FEL103.4	Evaluate co-efficient of friction between the different surfaces in contact.

FEL103.5	Demonstrate the types of collision/impact and determine corresponding coefficient of restitution
FEL103.6	Differentiate the kinematics and kinetics of a particle.

Subject Name : Basic Electrical Engineering

Subject Code : FEL104

Course Code : FEL104

FEL104.1	Analyze the behaviour of Direct Current circuits using network theorems.
FEL104.2	Perform experiment on single-phase Alternating Current circuits.
FEL104.3	Demonstrate experiment on three-phase Alternating Current circuits.
FEL104.4	Illustrate the performance of single-phase transformer and machines.

Subject Name : Basic Workshop Practice I

Subject Code : FEL105

Course Code : FEL105

FEL105.1	Develop the necessary skill required to handle/use different fitting tools.
FEL105.2	Develop skill required for hardware maintenance.
FEL105.3	Able to install an operating system and system drives.
FEL105.4	Able to identify the network components and perform basic networking and crimping.
FEL105.5	Develop the necessary skill required to handle/use different plumping tools.

Subject Name : Engineering Mathematics-II

Subject Code : FEC201

Course Code : FEC201

FEC201.1	Solve various types of First Order differential equation.
FEC201.2	Solve various types of Higher Order Differential equation.
FEC201.3	Illustrate the concepts of Beta and Gamma function,DUIS and rectification.
FEC201.4	Apply the concepts of Double integral
FEC201.5	Apply the concept of Triple integral.
FEC201.6	Apply the principles of Numerical Method for solving differential equation and numerical integration analytically and using Scilab also.

Subject Name : Engineering Physics-II
Subject Code : FEC202

Course Code : FEC202

FEC202.1	Describe the phenomenon of diffractions through slits and its application.
FEC202.2	Apply the foundation of laser and fiber optics in development of modern communication technology.
FEC202.3	Relate the basics of electrodynamics which is prerequisite for satellite communications, antenna theory etc.
FEC202.4	Explain the fundamentals of relativity.
FEC202.5	Paraphrase the wide scope of nanotechnology in modern developments and its role in emerging innovating applications.
FEC202.6	Interpret basic sensing techniques for physical measurements in modern instrumentations.

me : Engineering Chemistry-II
Subject Code : FEC203

Course Code : FEC203

FEC203.1	Distinguish the ranges of the electromagnetic spectrum used for exciting different molecular energy levels in various spectroscopic techniques.
FEC203.2	Illustrate the concept of emission spectroscopy and describe the phenomena of fluorescence and phosphorescence in relation to it.

FEC203.3	Explain the concept of electrode potential and nernst theory and relate it to electrochemical cells.
FEC203.4	Identify different types of corrosion and suggest control measures in industries.
FEC203.5	Illustrate the principles of green chemistry and study environmental impact.
FEC203.6	Explain the knowledge of determining the quality of fuel and quantify the oxygen required for combustion of fuel.

Subject Name : Engineering Graphics	
Subject Code : FEC204	
Course Code : FEC204	
FEC204.1	Apply the basic principles of projections in Projection of Lines and Planes
FEC204.2	Apply the basic principles of projections in Projection of Solids.
FEC204.3	Apply the basic principles of sectional views in Section of solids.
FEC204.4	Apply the basic principles of projections in converting 3D view to 2D drawing.
FEC204.5	Read a given drawing.
FEC204.6	Visualize an object from the given two views.

Subject Name : C Programming	
Subject Code : FEC205	
Course Code : FEC205	
FEC205.1	Understanding basic terminology, concept of data types, variables and operators in C Programming.
FEC205.2	Applying control statements and looping constructs in C.
FEC205.3	Applying function concept on problem statements.
FEC205.4	Applying concept of arrays, strings in C

FEC205.5	Applying concepts of structures and union.
FEC205.6	Applying dynamic memory concept by use of pointers.

me : Professional Communication and Ethics- I

Subject Code : FEC206	
Course Code : FEC206	
FEC206.1	Eliminate barriers and use verbal/non-verbal cues at social and workplace situations.
FEC206.2	Employ listening strategies to comprehend wide-ranging vocabulary. grammatical structures, tone and pronunciation.
FEC206.3	Prepare effectively for speaking at social, academic nnd business situations.
FEC206.4	Use reading strategies for faster comprehension, summarization and evaluation of text.
FEC206.5	Acquire effective writing skills for drafting academic. business and technical documen
FEC206.6	Successfully interact in all kinds of settings, displaying refined grooming and social skills.

me : Engineering Physics-II

Subject Code : FEL201	
Course Code : FEL201	
FEL201.1	Infer the output of the experiments based on diffraction through slit.
FEL201.2	Analyze the result of the experiments using laser and optical fibre.
FEL201.3	Analyze the result by performing the measurements using sensor.
FEL201.4	Create and design models to address the technical problems and learning life skills.

me : Engineering Chemistry-II

Subject Code : FEL202	

Course Code : FEL202	
FEL202.1	Determine moisture content
FEL202.2	Determine saponification
FEL202.3	Determine acid value of oil
FEL202.4	Determine flash point of a lubricating oil
FEL202.5	Synthesize a biofuel.

Subject Name : Engineering Graphics

Subject Code : FEL203

Course Code : FEL203	
FEL203.1	Apply the basic principles of projections in 2D drawings using a CAD software.
FEL203.2	Create, Annotate, Edit and Plot drawings using basic AutoCAD commands and features.
FEL203.3	Apply the concepts of layers to create drawing.
FEL203.4	Apply basic AutoCAD skills to draw different views of a 3D object.
FEL203.5	Apply basic AutoCAD skills to draw the isometric view from the given two views.

ame : C Programming

Subject Code : FEL204

Course Code : FEL204	
FEL204.1	Understand basic terminology, concept of data types, variables and operators in C Programming.
FEL204.2	Apply control statements and looping constructs in C.
FEL204.3	Apply function concept on problem statements.

FEL204.4	Apply concept of arrays, strings, structures and union.
FEL204.5	Apply dynamic memory concept by use of pointers.

Subject Name :   Professional Communication and Ethics- I

Subject Code : FEL205

FEL205.1	Listen and comprehend all types of spoken discoursesuccessfully
FEL205.2	Speak fluently and make effective professionalpresentations
FEL205.3	Read large quantities of text in a short time to comprehend,summaries and evaluate content
FEL205.4	Draft precise business letters, academic essays and technical guidelines.
FEL205.5	Dress finely and conduct themselves with panache in social, academic and professional situations.

Subject Name :   Basic Workshop practice-II

Subject Code : FEL206

Course Code : FEL206

FEL206.1	Develop the necessary skill required to handle/use different carpentry tools.
FEL206.2	Identify and understand the safe practices to adopt in electrical environment.
FEL206.3	Demonstrate the wiring practices for the connection of simple electrical load/ equipment.
FEL206.4	Design, fabricate and assemble pcb.
FEL206.5	Develop the necessary skill required to use different sheet metal and brazing tools.

Course outcomes A. Y. 2023-24

Department-Computer Engineering

Course Outcomes
After the completion of the course the student should be able to

Name: CSC301 Engineering Mathematics- III	**Year of Study: 2023-24**
CSC301.1	Understand the concept of Laplace transform and its application to solve the real integrals in engineering problems.
CSC301.2	Understand the concept of inverse Laplace transform of various functions and its applications in engineering problems.
CSC301.3	Expand the periodic function by using Fourier series for real life problems and complex engineering problems.
CSC301.4	Understand complex variable theory, application of harmonic conjugate to get orthogonal trajectories and analytic function.
CSC301.5	Apply the concept of Correlation and Regression to the engineering problems in data science, machine learning and AI.
CSC301.6	Understand the concepts of probability and expectation for getting the spread of the data and distribution of probabilities.
Course Name: CSC302 Discrete Structures and Graph Theory	**Year of Study: 2023-24**
CSC302.1	Understand the notion of mathematical thinking, mathematical proofs and to apply them in problem solving.

CSC302.2	Ability to reason logically.
CSC302.3	Ability to understand relations, functions, Diagraph and Lattice
CSC302.4	Ability to understand and apply concepts of graph theory in solving real world problems.
CSC302.5	Understand use of groups and codes in Encoding-Decoding.
CSC302.6	Analyze a complex computing problem and apply principles of discrete mathematics to identify solutions
Course Name: CSC303 Data Structures	**Year of Study: 2023-24**
CSC303.1	Implementing Linear and Non-linear data structures
CSC303.2	Handling Various operations like searching, insertion, deletion and traversals on various data structures.
CSC303.3	Explaining various data structures, related terminologies and its types.
CSC303.4	Selecting appropriate data structures and apply it to solve problems in various domains.
CSC303.5	Analyzing and implementing appropriate searching techniques for a given problem.
CSC303.6	Analyzing, designing, applying, and using data structures to ssolve engineering problems and evaluating their

Course Name: CSC304 Digital Logic and Computer architecture Year of Study: 2023-2024	
CSC304.1	To learn different number systems and basic structure of computer system.
CSC304.2	To demonstrate the arithmetic algorithms.
CSC304.3	To understand the basic concepts of digital components and processor organization.
CSC304.4	To understand the generation of control signals of computer.
CSC304.5	To demonstrate the memory organization.
CSC304.6	To describe the concepts of parallel processing and different Buses.
Course Name: CSC305 Computer Graphics Year of Study: 2023-2024	
CSC305 .1	Students will be able to understand the basic concepts of Computer Graphics.
CSC305 .2	Students will be able to implement the various algorithms for scan conversion and filling of basic objects and their
CSC305 .3	Students will be able to apply 2D geometric transformations.
CSC305 .4	Students will be able to apply 2D Viewing & Clipping

CSC305 .5	Students will be able to understand 3D Object representations, Geometric Transformation and Viewing
CSC305 .6	Students will be able to understand Visible Surface Detection, Illumination Models and Surface Rendering
Course Name: CSL301 Data Structure Lab Lab Year of Study: 2023-24	
CSL301.1	Students will be able to implement linear data structures & be able to handle operations like insertion, deletio
CSL301.2	Students will be able to implement nonlinear data structures & be able to handle operations like insertion, del
CSL301.3	Students will be able to choose appropriate data structure and apply it in various problems
CSL301.4	Students will be able to select appropriate searching techniques for given problems.
Course Name: CSL302 Digital logic and Computer Organisation lab Year of Study: 2023-24	
CSL302.1	To understand the basics of digital components
CSL302.2	Design the basic building blocks of a computer: ALU, registers, CPU and memory
CSL302.3	To recognize the importance of digital systems in computer architecture
CSL302.4	To implement various algorithms for arithmetic operations.

Course Name: CSL303 Computer Graphics Lab Year of Study: 2023-24	
CSL303.1	Implement various output and filled area primitive algorithms
CSL303.2	Apply transformation, projection and clipping algorithms on graphical objects.
CSL303.3	Perform curve and fractal generation methods.
CSL303.4	Develop a Graphical application/Animation based on learned concept
Course Name: CSL304 OOPM(Java) Lab Year of Study: 2023-24	
CSL304.1	To apply fundamental programming constructs.
CSL304.2	To illustrate the concept of packages, classes and objects.
CSL304.3	To elaborate the concept of strings, arrays and vectors.
CSL304.4	To implement the concept of inheritance and interfaces.
CSL304.5	To implement the concept of exception handling and multithreading.
CSL304.6	To develop GUI based application.

Course Name: CSM-301 Mini Project 1- A Year of Study: 2023-24	
CSM301.1	Identify the problems based on societal/research needs
CSM301.2	Apply Knowledge, skill to solve societal problems in a group.
CSM301.3	Develop interpersonal skills to work as member of a group or leader.
CSM301.4	Draw the proper inferences from available results through theoretical/experimental/simulations.
CSM301.5	Analyze the impact of solutions in societal and environmental context for sustainable development.
CSM301.6	Use standard norms of engineering practices
CSM301.7	Excel in written and oral communication.
CSM301.8	Demonstrate capabilities of self-learning in a group, which leads to lifelong learning.
CSM301.9	Demonstrate project management principles during project work.
Course Name: CSC401 Engineering Mathematics- IV: 2023-24	
CSC401.1	Apply the concepts of eigen values and eigen vectors in engineering problems.

CSC401.2	Use the concepts of Complex Integration for evaluating integrals,computing residues & evaluate various cont
CSC401.3	Apply the concept of Z- transformation and its inverse in engineering problems.
CSC401.4	Use the concept of probability distribution and sampling theory to engineering problems.
CSC401.5	Apply the concept of Linear Programming Problems of optimization
CSC401.6	Solve Non-Linear Programming Problems to engineering problems of optimization.
Course Name: CSC402 Analysis of Algorithms Year of Study: 2023-24	
CSC402.1	Analyze the running time and space complexity of algorithms.
CSC402.2	Describe, apply and analyze the complexity of divide and conquer strategy.
CSC402.3	Describe, apply and analyze the complexity of greedy strategy
CSC402.4	Describe, apply and analyze the complexity of dynamic programming strategy.
CSC402.5	Explain and apply backtracking, branch and bound.
CSC402.6	Explain and apply string matching techniques

Course Name: CSC403 Database Management System Year of Study: 2023-24	
CSC403.1	Understand the need of database management systems.
CSC403.2	Design ER and EER diagram for real life applications.
CSC403.3	Convert ER and EER model to Relational Model.
CSC403.4	Design database using SQL.
CSC403.5	Apply the concept of normalization to relational database design.
CSC403.6	Understand the concept of transaction, concurrency and recovery.
Course Name: CSC404 Operating System Year of Study: 2023-24	
CSC404.1	Understand the objectives, functions and structure of OS
CSC404.2	Analyze the concept of process management and evaluate performance of processscheduling algorithms.
CSC404.3	Understand and apply the concepts of synchronization and deadlocks
CSC404.4	Evaluate performance of Memory allocation and replacement policies

CSC404.5	Understand the concepts of file management.
CSC404.6	Apply concepts of I/O management and analyze techniques of disk scheduling
Course Name CSC405 Microprocessor Year of Study: 2023-24	
CSC405.1	**Describe core concepts of 8086 microprocessor.**
CSC405.2	**Interpret the instructions of 8086 and write assembly and Mixed language programs.**
CSC405.3	**Identify the specifications of peripheral chip.**
CSC405.4	**Design 8086 based system using memory and peripheral chips.**
CSC405.5	**Appraise the architecture of advanced processors**
CSC405.6	**Understand hyperthreading technology**
Course Name CSL401 Analysis of Algorithm Lab Year of Study: 2023-24	
CSL401.1	Implement the algorithms using different approaches
CSL401.2	Analyze the complexities of various algorithms.

CSL401.3	Compare the complexity of the algorithms for specific problem
Course Name: CSL402 Database Management system Lab Lab Year of Study: 2023-24	
CSL402.1	Design ER /EER diagram and convert to relational model for the realworld application.
CSL402.2	Apply DDL, DML, DCL and TCL commands
CSL402.3	Write simple and complex queries
CSL402.4	UsePL / SQL Constructs.
CSL402.5	Demonstrate the concept of concurrent transactions execution and frontend-backend connectivity
Course Name: CSL403 Operating system Lab: 2023-24	
CSL403.1	Demonstrate basic Operating system Commands, Shell scripts, System Calls and API wrt Linux
CSL403.2	Implement various process scheduling algorithms and evaluate their performance.
CSL403.3	Implement and analyze concepts of synchronization and deadlocks.
CSL403.4	Implement various Memory Management techniques and evaluate their performance.

CSL403.5	Implement and analyze concepts of virtual memory.
CSL403.6	Demonstrate and analyze concepts of file management and I/O management techniques.
Course Name: CSL404 Microprocessor Lab Year of Study: 2023-24	
CSL404.1	**Use appropriate instructions to program microprocessor to perform various task**
CSL404.2	**Develop the program in assembly/ mixed language for Intel 8086 processor**
CSL404.3	**Demonstrate the execution and debugging of assembly/ mixed language program**
Course Name: CSL405 Skill base Lab course: Python Programming Year of Study: 2023-24	
CSL405.1	**To understand basic concepts in python.**
CSL405.2	**To explore contents of files, directories and text processing with python**
CSL405.3	**To develop program for data structure using built in functions in python**
CSL405.4	**To explore django web framework for developing python-based web application.**
CSL405.5	**To understand Multithreading concepts using python.**

Course Name: CSM401 Mini Project 1 - B Year of Study: 2023-24	
CSM401.1	Identify the problems based on societal/research needs
CSM401.2	Apply Knowledge, skill to solve societal problems in a group.
CSM401.3	Develop interpersonal skills to work as member of a group or leader.
CSM401.4	Draw the proper inferences from available results through theoretical/experimental/simulations.
CSM401.5	Analyze the impact of solutions in societal and environmental context for sustainable development.
CSM401.6	Use standard norms of engineering practices
CSM401.7	Excel in written and oral communication.
CSM401.8	Demonstrate capabilities of self-learning in a group, which leads to lifelong learning.
CSM401.9	Demonstrate project management principles during project work.
Course Name: CSC501 Theory of Computer Science Year of Study: 2023-24	

CSC501.1	Understand the difference between NFA and DFA .
CSC501.2	Apply the equivalence of languages described by finite automata and regular expressions
CSC501.3	Apply regular, context free grammars while recognizing the strings and tokens.
CSC501.4	Design pushdown automata to recognize the language
CSC501.5	Develop an understanding of computation through Turing Machine.
CSC501.6	Apply problems on decidability and undecidability
Course Name: CSC502 Software Engineering Year of Study: 2023-24	
CSC502.1	**Identify requirements & assess the process models.**
CSC502.2	**Plan, schedule and track the progress of the projects.**
CSC502.3	**Design the software projects.**
CSC502.4	**Do testing of software project.**
CSC502.5	**Identify risks, manage the change to assure quality in software projects.**

Course Name:CSC503 Computer Network Year of Study: 2023-24	
CSC503.1	Demonstrate the concepts of data communication at physical layer and compare ISO - OSI model with TCP/IP model.
CSC503.2	Explore different design issues at data link layer.
CSC503.3	Design the network using IP addressing and sub netting / supernetting schemes.
CSC503.4	Analyze transport layer protocols and congestion control algorithms.
CSC503.5	Explore protocols at application layer
CSC503.6	Explore the different protocols used at application layer i.e. HTTP, SNMP, SMTP, FTP, TELNET and VPN.
Course Name: Data Warehousing and Data Mining Year of Study: 2023-24	
CSC504.1	Understand data warehouse fundamentals and design data warehouse with dimensional modelling and apply OLAP operations.
CSC504.2	Understand data mining principles and perform Data preprocessing and Visualization.
CSC504.3	Identify appropriate data mining algorithms to solve real world problems.
CSC504.4	Compare and evaluate different data mining techniques like classification, prediction, clustering and association rule mining

CSC504.5	Describe complex information and social networks with respect to web mining.

Course Name: Business Communication & Ethics II Year of Study: 2023-24	
CSL504.1	Plan and prepare effective business/ technical documents which will in turn provide solid foundation for their future managerial roles
CSL504.2	Strategize their personal and professional skills to build a professional image and meet the demands of the industry.
CSL504.3	Emerge successful in group discussions, meetings and result-oriented agreeable solutions in group communication situations.
CSL504.4	Deliver persuasive and professional presentations.
CSL504.5	Develop creative thinking and interpersonal skills required for effective professional communication.
CSL504.6	Apply codes of ethical conduct, personal integrity and norms of org

Course Name: Internet Programming	
CSDL5012.1	Implement interactive web page(s) using HTML and CSS
CSDL5012.2	Design a responsive web site using JavaScript
CSDL5012.3	Demonstrate database connectivity using JDBC

CSDL5012.4	Demonstrate Rich Internet Application using Ajax
CSDL5012.5	Demonstrate and differentiate various Web Extensions.
CSDL5012.6	Demonstrate web application using Reactive Js
Course Name: Computer Networks Lab Year of study: 2023-24	
CSL502.1	Design and setup networking environment in Linux
CSL502.2	Use Network tools and simulators such as NS2, Wireshark etc. to explore networking algorithms and protocc
CSL502.3	Implement programs using core programming APIs for understanding networking concepts.
Course Name: Dataware Housing and mining Lab Year of Study: 2023-24	
CSL503.1	Design data warehouse and perform various OLAP operations.
CSL503.2	Implement data mining algorithms like classification.
CSL503.3	Implement clustering algorithms on a given set of data sample.

CSL503.4	Implement Association rule mining
CSL503.5	Implement various visualisation techniques
CSL503.6	Implement various web mining algorithm.
Course Name: Software Engineering Lab **Year of Study: 2023-24**	
CSL501. 1	**Identify requirements and apply software process model to selected case study.**
CSL501. 2	**Develop architectural models for the selected case study.**
CSL501. 3	**Use computer-aided software engineering (CASE) tools.**
Course Name:PCE **Year of Study: 2023-24**	
CSL504.1	Plan and prepare effective business/ technical documents which will in turn provide solid foundation for their future managerial roles
CSL504.2	Strategize their personal and professional skills to build a professional image and meet the demands of the industry.
CSL504.3	Emerge successful in group discussions, meetings and result-oriented agreeable solutions in group communication situations.
CSL504.4	Deliver persuasive and professional presentations.

CSL504.5	Develop creative thinking and interpersonal skills required for effective professional communication.
CSL504.6	Apply codes of ethical conduct, personal integrity and norms of org
Course Name: Mini Project 2A	**Year of Study: 2023-24**
CSM501.1	Identify societal/research/innovation/entrepreneurship problems through appropriate literature surveys
CSM501.2	Identify Methodology for solving above problem and apply engineering knowledge and skills to solve it
CSM501.3	Validate, Verify the results using test cases/benchmark data/theoretical/inferences/experiments/simulations
CSM501.4	Analyze and evaluate the impact of solution/product/research/innovation/entrepreneurship towards societal/environmental/sustainable development
CSM501.5	Use standard norms of engineering practices and project management principles during project work
CSM501.6	Communicate through technical report writing and oral presentation.
	● The work may result in research/white paper/ article/blog writing and publication
	● The work may result in business plan for entrepreneurship product created
	● The work may result in patent filing.

CSM501.7	Gain technical competency towards participation in Competitions, Hackathons, etc.
CSM501.8	Demonstrate capabilities of self-learning, leading to lifelong learning.
CSM501.9	Develop interpersonal skills to work as a member of a group or as leader
Course Name: System Programming and Compiler Construction **Year of Study: 2023-24**	
CSC601.1	**Identify the relevance of different system programs..**
CSC601.2	**Explain various data structures used for assembler and macroprocessor design.**
CSC601.3	**Distinguish between different loaders and linkers and their contribution in developing efficient user applications**
CSC601.4	**Understand fundamentals of compiler design and identify the relationships among different phases of the compiler.**
Course Name: CSS **Year of Study: 2023-24**	
CSC602.1	Understand system security goals and concepts, classical encryption techniques and acquire fundamental knowledge on the concepts of modular arithmetic and number theory
CSC602.2	Understand, compare and apply different encryption and decryption techniques to solve problems related to confidentiality and authentication
CSC602.3	Apply different message digest and digital signature algorithms to verify integrity and achieve authentication and design secure applications

CSC602.4	Understand network security basics, analyse different attacks on networks and evaluate the performance of firewalls and security protocols like SSL, IPSec, and PGP
CSC602.5	Analyse and apply system security concept to recognize malicious code
Course Name: Mobile Computing Year of Study: 2023-24	
CSC603.1	To identify basic concepts and principles in computing
CSC603.2	To describe the components and functioning of cellular architecture.
CSC603.3	To describe the components and functioning of mobile networking.
CSC603.4	To classify variety of security techniques in mobile network
CSC603.5	To apply the concepts of WLAN for local as well as remote applications
CSC603.6	To describe Long Term Evolution (LTE) architecture and its interfaces.
Course Name Artificial Intelligence Year of Study: 2023-24	
CSC604.1	Ability to develop a basic understanding of AI building blocks presented in intelligent agents
CSC604.2	Ability to choose an appropriate problem solving method and knowledge representation technique.

CSC604.3	Ability to analyze the strength and weaknesses of AI approaches to knowledge– intensive problem solving.
CSC604.4	Ability to design models for reasoning with uncertainty as well as the use of unreliable information.
CSC604.5	Ability to design and develop AI applications in real world scenarios.

Course Name	DLOC- IOT Year of Study: 2023-24	
CSDL6011.1	Understand the concepts of IoT and the Things in IoT.	
CSDL6011.2	Emphasize core IoT functional Stack and understand application protocols for IoT.	
CSDL6011.3	Apply IoT knowledge to key industries that IoT is revolutionizing.	
CSDL6011.4	Examines various IoT hardware items and software platforms used in projects.	
CSDL6011.5	Apply Domain Specific IoTs CASE STUDY like smart home or smart city	
CSDL6011.6	Examines various IoT hardware items and software platforms used in projects.	

Course Name SPCC LAB Year of Study: 2023-24	

CSL601.1	**Generate machine code by implementing two pass assemblers. 3 45**
CSL601.2	**Implement Two pass macro processor.**
CSL601.3	**Parse the given input string by constructing Top down/Bottom-up parser.**
CSL601.4	**Identify and Validate tokens for given high level language and Implement synthesis phase of compiler.**
CSL601.5	**Explore LEX & YACC tools.**
Course Name CSS LAB Year of Study: 2023-24	
CSL602.1	Apply the knowledge of symmetric and asymmetric cryptography to implement simple ciphers.
CSL602.2	Explore the different network reconnaissance tools to gather information about networks.
CSL602.3	Explore and use tools like sniffers, port scanners and other related tools for analysing packets in a Network.
CSL602.4	Set up firewalls and intrusion detection systems using open-source technologies and to explore email security.
CSL602.5	Explore various attacks like buffer-overflow and web application attack.

Course Name:MC LAB	Year of Study: 2023-24
CSL603.1	develop and demonstrate mobile applications using various tools
CSL603.2	articulate the knowledge of GSM, CDMA & Bluetooth technologies and demonstrate it.
CSL603.3	Students will able to carry out simulation of frequency reuse, hidden/exposed terminal problem
CSL603.4	Implement security algorithms for mobile communication network
CSL603.5	Explore the various security tools in Mobile computing
CSL603.6	Demonstrate simulation and compare the performance of Wireless LAN
Course Name:AI LAB	**Year of Study: 2023-24**
CSL604.1	Identify languages and technologies for Artificial Intelligence
CSL604.2	Understand and implement uninformed and informed searching techniques for real world problems.
CSL604.3	Understand and implement heuristic search techniques
Course Name:Skill Based Cloud Computing Lab	**Year of Study: 2023-24**

CSL605.1	Implement different types of virtualization techniques.
CSL605.2	Analyze various cloud computing service models and implement them to solve the given problems.
CSL605.3	Design and develop real world web applications and deploy them on commercial cloud(s).
CSL605.4	Explain major security issues in the cloud and mechanisms to address them.
CSL605.5	Explore various commercially available cloud services and recommend the appropriate one for the given appl
CSL605.6	Implement the concept of containerization
Course Name: Machine Learning Year of Study: 2023-24	
CSC701.1	To acquire fundamental knowledge of developing machine learning models
CSC701.2	To apply an appropriate machine learning model for regression
CSC701.3	To demonstrate ensemble techniques to combine predictions from different models
CSC701.4	To demonstrate the dimensionality reduction techniques
CSC701.5	To apply an appropriate machine learning model for classification

CSC701.6	To apply appropriate model for clustering
Course Name: Natural Language Processing **Year of Study: 2023-24**	
CSDC7013.1	To describe the field of natural language processing.
CSDC7013.2	To design language model for word level analysis for text processing
CSDC7013.3	To design various POS tagging techniques and parsers.
CSDC7013.4	To design, implement and test algorithms for semantic and pragmatic analysis
CSDC7013.5	To formulate the discourse segmentation and anaphora resolution
CSDC7013.6	To apply NLP techniques to design real world NLP applications
Course Name: Big Data Analytics **Year of Study: 2023-24**	
CSDLO7032.1	Understand the building blocks of Big Data Analytics.
CSDLO7032.2	Apply fundamental enabling techniques like Hadoop and MapReduce in solving real world problems.

CSDLO7032.3	Understand different NoSQL systems and how it handles big data.
CSDLO7032.4	Apply advanced techniques for emerging applications like stream analytics.
CSDLO7032.5	Achieve adequate perspectives of big data analytics in various applications like recommender systems, social media applications, etc.
CSDLO7032.6	Apply statistical computing techniques and graphics for analyzing big data.
Course Name: Block chain **Year of Study: 2023-24**	
CSDC7022.1	Explain blockchain concepts
CSDC7022.2	Apply cryptographic hash required for blockchain.
CSDC7022.3	Apply the concepts of smart contracts for an application
CSDC7022.4	Design a public blockchain using Ethereum
CSDC7022.5	Design a private blockchain using Hyperledger
CSDC7022.6	Use different types of tools for blockchain applications
Course Name: ARVR **Year of Study: 2023-24**	

CSDL7021.1	Describe how VR systems work and list the applications of VR
CSDL7021.2	Elaborate geometric presentation of the virtual world and its operations.
CSDL7021.3	Explain the concepts of motion and tracking in VR systems.
CSDL7021.4	Design and implementation of the hardware that enables VR systems tobe built.
CSDL7021.5	Describe how AR systems work and analyze the hardware requirement of AR
CSDL7021.6	Analyze and understand the working of various state of the art AR devices.
Course Name: CSL **Year of Study: 2023-24**	
ILO 7016.1	Understand the concept of cybercrime and its effect on outside world
ILO 7016.2	Interpret and apply IT law in various legal issues
ILO 7016.3	Distinguish different aspects of cyber law
ILO 7016.4	Apply Information Security Standards compliance during software design and development
ILO 7013.1	Explain how information systems Transform Business

ILO 7013.2	Identify the impact information systems have on an organization	
ILO 7013.3	Describe IT infrastructure and its components and its current trends	
ILO 7013.4	Understand the principal tools and technologies for accessing information from databases to improve business performance and decision making	
ILO 7013.5	Identify the types of systems used for enterprise-wide knowledge management and how they provide value for businesses	

Course Name: ML LAB		Year of Study: 2023-24
CSL7011	To implement an appropriate machine learning model for Supervised algorithms	
CSL7012	To implement an appropriate machine learning model for unSupervised algorithms	
CSL7013	To implement an appropriate machine learning model forReinforcement algorithms	
CSL7014	To implement ensemble techniques to combine predictions from different models	
CSL7015	To implement the dimensionality reduction techniques	
CSL7016	Analyze and evaluate the impact of solution/product/research/innovation/entrepreneurship towards societal/environmental/sustainable development	

Course Name: NLP LAB		Year of Study: 2023-24

CSDL7013.1	Apply various text processing techniques
CSDL7013.2	Design language model for word level analysis.
CSDL7013.3	Model linguistic phenomena with formal grammar
CSDL7013.4	Design, implement and analyze NLP algorithms.
CSDL7013.5	To apply NLP techniques to design real world NLP applications such as machine translation, sentiment analysis, text summarization, information extraction, Question Answering system etc.
CSDL7013.6	Implement proper experimental methodology for training and evaluating empirical NLP systems.
Course Name: Block chain Lab Year of Study: 2023-24	
CSDL7022.1	Creating Cryptographic hash using merkle tree.
CSDL7022.2	Design Smart Contract using Solidity.
CSDL7022.3	Implementing ethereum blockchain using Geth.
CSDL7022.4	Explore various types of blockchain
CSDL7022.5	Implement security tools in blockchain

CSDL7022.6	Demonstrate the concept of blockchain in real world application.
Course Name: Major Project **Year of Study: 2023-24**	
CSP701.1	To develop the understanding of the problem domain through extensive review of literature.
CSP701.2	To Identify and analyze the problem in detail to define its scope with problem specific data.
CSP701.3	To know various techniques to be implemented for the selected problem and related technical skills through feasibility analysis.
CSP701.4	To design solutions for real-time problems that will positively impact society and environment..
CSP701.5	To develop clarity of presentation based on communication, teamwork and leadership skills.
CSP701.6	To inculcate professional and ethical behavior.
Course Name: Applied Data Science **Year of Study: 2023-24**	
CSDC8013.1	**To gain fundamental knowledge of the data science process.**
CSDC8013.2	**To apply data exploration and visualization techniques.**
CSDC8013.3	**To apply anomaly detection techniques.**

CSDC8013.4	**To gain an in-depth understanding of time-series forecasting.**
CSDC8013.5	**Apply different methodologies and evaluation strategies.**
CSDC8013.6	**To apply data science techniques to real world applications.**
Course Name: Social Media Analytics Year of Study: 2023-24	
CSDC8023.1	**Understand the concept of Social media**
CSDC8023.2	**Understand the concept of social media Analytics and its significance.**
CSDC8023.3	**Learners will be able to analyze the effectiveness of social media**
CSDC8023.3	**Learners will be able to use different Social media analytics tools effectively and efficiently.**
CSDC8023.5	**Learners will be able to use different effective Visualization techniques to represent social media analyt**
CSDC8023.6	**Acquire the fundamental perspectives and hands-on skills needed to work with social media data.**
Course Name:Project Management Year of Study: 2023-24	
ILO8021.1	Apply selection criteria and select an appropriate project from different options.

ILO8021.2	Write work break down structure for a project and develop a schedule based on it.
ILO8021.3	Identify opportunities and threats to the project and decide an approach to deal with them strategically.
ILO8021.4	Use Earned value technique and determine & predict status of the project.
ILO8021.5	Capture lessons learned during project phases and document them for future reference
Course Name: Envioronment Management Year of Study: 2023-24	
ILO8029.1	Understand the concept of evirionmental Management
ILO8029.2	Understands the Global Environmental concerns
ILO8029.3	Understand ecosystem ,interdependance and food chain
ILO8029.4	Understand and interpret environment related legislation
Course Name: ADS Lab Year of Study: 2023-24	
CSL8023.1	Apply various stages of the data science lifecycle for the selected case study.
CSL8023.2	Demonstrate data preparation, exploration and visualization techniques.

CSL8023.3	Implement and evaluate different supervised and unsupervised techniques.

Course Name: SMA Lab	**Year of Study: 2023-24**
CSDL8023.1	Understand characteristics and types of social media networks.
CSDL8023.2	Use social media analytics tools for business
CSDL8023.3	Collect, monitor , store and track social media data
CSDL8023.4	Analyze and visualize social media data from multiple platforms
CSDL8023.5	Design and develop content and structure based social media analytics models.
CSDL8023.6	Design and implement social media analytics applications for business.
Course Name: Major Project2	**Year of Study: 2023-24**
CSP801.1	Implement solutions for the selected problem by applying technical and professional skills.
CSP801.2	Analyze impact of solutions in societal and environmental context for sustainable development.

CSP801.3	Collaborate best practices along with effective use of modern tools.
CSP801.4	Develop proficiency in oral and written communication with effective leadership and teamwork.
CSP801.5	Nurture professional and ethical behavior.
CSP801.6	Gain expertise that helps in building lifelong learning experience.

Course outcomes A. Y. 2023-24

DEPARTMENT OF EXTC

Course Code	Course Outcomes
Course Name: ECC 301 Engineering Mathematics- III Year of Study: 2023-24	
ECC 301.1	Understand the concept of Laplace Transform of and it's application to solve the real integrals in Engineering Problem .
ECC 301.2	Understand the concept of Inverse Laplace Transform of various function and and it's application to solve the real integrals in Engineering Problem .
ECC 301.3	Expand the periodic function by using fourier series for real life problems and Complex Engineering Problem .
ECC 301.4	Understand Complex variable theory, application of harmonic conjugate to get orthogonal trajectories and analytic function.
ECC 301.5	Use Matrix Algebra to solve to solve the Engineering problems.
ECC 301.6	Apply the concept of vector calculus in real life problems.
Course Name: ECC 301 Engineering Mathematics- III - DSE Year of Study: 2023-24	
ECC 301.1	Understand the concept of Laplace Transform of and it's application to solve the real integrals in Engineering Problem .
ECC 301.2	Understand the concept of Inverse Laplace Transform of various function and and it's application to solve the real integrals in Engineering Problem .
ECC 301.3	Expand the periodic function by using fourier series for real life problems and Complex Engineering Problem .

ECC 301.4	Understand Complex variable theory, application of harmonic conjugate to get orthogonal trajectories and analytic function.
ECC 301.5	Use Matrix Algebra to solve to solve the Engineering problems.
ECC 301.6	Apply the concept of vector calculus in real life problems.
Course Name: ECC302 Electronic Devices and Circuits I (DSE EXTC) Year of Study: 2023-24	
ECC302.1	Analyze small signal model of bipolar junction transistor & Metal Oxide field effect transistor for voltage gain, input impedance, output impedance, voltage gain.
ECC302.2	Evaluate frequency response to understand behavior of electronic circuits.
ECC302.3	Design & simulate series fed Class A power amplifier for given specification & calculate its efficiency
ECC302.4	Design & simulate enhancement type metal oxide semiconductor field effect transistor differential amplifier for given specifications
Course Name: ECC302 Electronic Devices and Circuits I Year of Study: 2023-24	
ECC302.1	Understand current voltage characteristics of semiconductor devices
ECC302.2	Analyze DC biasing circuits of Bipolar junction transistor & Metal Oxide field effect transistor for Quiescent point & stability factor
ECC302.3	Analyze small signal model of bipolar junction transistor & Metal Oxide field effect transistor for voltage gain, input impedance, output impedance, voltage gain.
ECC302.4	Evaluate frequency response to understand behavior of electronic circuits.
ECC302.5	Design & simulate series fed Class A power amplifier for given specification & calculate its efficiency

ECC302.6	Design & simulate enhancement type metal oxide semiconductor field effect transistor differential amplifier for given specifications
Course Name: ECC303 Digital System Design	**Year of Study: 2023-24**
ECC303.1	Perform number conversions and arithmetic operations on binary number systems
ECC303.2	Explain various logic families and logic gates using truth table
ECC303.3	Design combinational logic circuits using K-Maps and logic gates
ECC303.4	Design sequential logic circuits using state diagram,K-Maps and logic gates
ECC303.5	Classify memories and programmable logic devices based on characteristics and operations
ECC303.6	Understand VHDL and its application in design of combinational and sequential logic circuits
Course Name: ECC304 Network Theory	**Year of Study: 2023-24**
ECC304.1	Apply their knowledge in analyzing Circuits by using network theorems.
ECC304.2	Apply the time and frequency method of analysis.
ECC304.3	Evaluate circuit using graph theory.
ECC304.4	Find the various parameters of two port network.
ECC304.5	Apply network topology for analyzing the circuit.

ECC304.6	Synthesize the network using passive elements.
Course Name: ECC304 Network Theory - DSE **Year of Study: 2023-24**	
ECC304.1	Apply their knowledge in analyzing Circuits by using network theorems.
ECC304.2	Apply the time and frequency method of analysis.
ECC304.3	Evaluate circuit using graph theory.
ECC304.4	Find the various parameters of two port network.
ECC304.5	Apply network topology for analyzing the circuit.
ECC304.6	Synthesize the network using passive elements.
Course Name: ECC305 Electronic Instrumentation and Control System **Year of Study: 2023-24**	
ECC305.1	Learn measurement of physical parameters using various transducer and sensors.
ECC305.2	Learn principle of operation for various sensors.
ECC305.3	Describe functional Control system.
ECC305.4	Apply the concepts of control systems in calculating the transfer functions for given system.
ECC305.5	Calculate the stability of given system using appropriate criteria in time domain.

ECC305.6	Calculate the stability of given system using appropriate criteria in frequency domain.
Course Name: ECC305 Electronic Instrumentation and Control System (DSE) Year of Study: 2023-24	
ECC305.1	Learn measurement of physical parameters using various transducer and sensors.
ECC305.2	Calculate the stability of given system using appropriate criteria in time domain.
ECC305.3	Calculate the stability of given system using appropriate criteria in frequency domain.
Course Name: ECL301 Electronic Devices and Circuits I Laboratory Year of Study: 2023-24	
ECL301.1	Understand current voltage characteristics of semiconductor devices
ECL301.2	Design & Simulate Bipolar junction transistor & Metal Oxide Semiconductor Field effect transistor
ECL301.3	Evaluate frequency response to understand behavior of electronic circuits
ECL301.4	Design & simulate two stage Bipolar junction transistor amplifier for given specification
ECL301.5	Design & simulate series fed Class A power amplifier for given specification & calculate its efficiency
ECL301.6	Design & simulate enhancement type metal oxide semiconductor field effect transistor differential amplifier for given specifications
Course Name: ECL301 Electronic Devices and Circuits I Laboratory - DSE Year of Study: 2023-24	
ECL301.1	Understand current voltage characteristics of semiconductor devices

ECL301.2	Design & Simulate Bipolar junction transistor & Metal Oxide Semiconductor Field effect transistor
ECL301.3	Evaluate frequency response to understand behavior of electronic circuits
ECL301.4	Design & simulate two stage Bipolar junction transistor amplifier for given specification
ECL301.5	Design & simulate series fed Class A power amplifier for given specification & calculate its efficiency
ECL301.6	Design & simulate enhancement type metal oxide semiconductor field effect transistor differential amplifier for given specifications
Course Name: ECL302 Digital System Design Laboratory Year of Study: 2023-24	
ECL302.1	Verify logic gates using virtual tools
ECL302.2	Implement arithmetic circuits using virtual tools to verify operation
ECL302.3	Implement combinational logic circuits using virtual tools to verify operation
ECL302.4	Implement sequential logic circuits using virtual tools to verify operation
Course Name: ECL302 Digital System Design Laboratory - DSE Year of Study: 2023-24	
ECL302.1	Verify logic gates using virtual tools
ECL302.2	Implement arithmetic circuits using virtual tools to verify operation
ECL302.3	Implement combinational logic circuits using virtual tools to verify operation

ECL302.4	Implement sequential logic circuits using virtual tools to verify operation
Course Name: ECL303 Electronics Instrumentation & Control System Laboratory Year of Study: 2023-24	
ECL303.1	Validate the performance characteristics of transducers.
ECL303.2	Validate the characteristics of various temperature, pressure and level transducers.
ECL303.3	Plot frequency response of first-order electrical system.
ECL303.4	Analyze time response of second-order electrical system and calculate the steady-state error
ECL303.5	Validate the effect of damping factor on the response of second order system.
ECL303.6	Analyze the frequency response specifications of systems by using bode-plot, Polar plot, Nyquist-plot techniques, and comment on the stability of system
Course Name: ECL303 Electronics Instrumentation & Control System Laboratory - DSE Year of Study: 2023-24	
ECL303.1	Analyze the performance characteristics of transducers.
ECL303.2	Plot frequency response of first-order electrical system.
ECL303.3	Simulate the input and output relation of a control system.
Course Name: ECL304 Skill Lab-: C++ and JavaProgramming Year of Study: 2023-24	
ECL304.1	Understand the basic principles of Object Oriented Programming

ECL304.2	Apply Object Oriented Programming principles for effective programming
ECL304.3	Develop programming applications using OOP language.
ECL304.4	Implement different programming applications using packaging.
ECL304.5	Apply the concepts of Exception handling & Multithreading.
ECL304.6	Understand the concepts of Applets
Course Name: ECL304 Skill Lab-: C++ and JavaProgramming - DSE **Year of Study: 2023-24**	
ECL304.1	Understand the basic principles of Object Oriented Programming
ECL304.2	Apply Object Oriented Programming principles for effective programming
ECL304.3	Develop programming applications using OOP language.
ECL304.4	Implement different programming applications using packaging.
ECL304.5	Apply the concepts of Exception handling & Multithreading.
ECL304.6	Understand the concepts of Applets
Course Name: ECM301 Mini Project 1-A **Year of Study: 2023-24**	
ECM301.1	Create the electrons circuit for particular application/experiment.

ECM301.2	Design and simulate the circuit by putting together analog and digital components.
ECM301.3	Learn the technique of soldering and circuit implementation on general purpose printed circuit board (GPP).
ECM301.4	Apply PCB design process and gain up-to-date knowledge of PCB design software.
ECM301.5	Apply the basic electronic tool and equipment's like (DMM, CRO, DSO etc.) studied to implement the project.
ECM301.6	Analysis of hardware fault (fault detection and correction)
Course Name: ECM301 Mini Project 1-A - DSE **Year of Study: 2023-24**	
ECM301.1	Create the electrons circuit for particular application/experiment.
ECM301.2	Design and simulate the circuit by putting together analog and digital components.
ECM301.3	Learn the technique of soldering and circuit implementation on general purpose printed circuit board (GPP).
ECM301.4	Apply PCB design process and gain up-to-date knowledge of PCB design software.
ECM301.5	Apply the basic electronic tool and equipment's like (DMM, CRO, DSO etc.) studied to implement the project.
ECM301.6	Analysis of hardware fault (fault detection and correction)
Course Name: ECC401 Engineering Mathematics IV **Year of Study: 2023-24**	
ECC401.1	Use the concept of Complex Integration for evaluating integrals computing residues & evaluate various contour integrals.

ECC401.2	Apply concept of correlation and regression to the engineering problem in Data science, AT & Machine learning .
ECC401.3	Apply the concept of Probability and expectation for getting the spread of the data and distribution of probabilities.
ECC401.4	Apply the concept of vector spaces and orthogonalization process in engineering problems.
ECC401.5	Use the concept of Quadratic form and singular value decomposition which are very useful tool in Engineering application.
ECC401.6	Find the extremals of the functional using concept of calculus of variation.
Course Name: ECC402 Microcontrollers Year of Study: 2023-24	
ECC402.1	Explain microprocessor architecture with program counter, stack pointer, interrupt, subroutine and Direct memory access.
ECC402.2	Explain primary, secondary, virtual, cache, semiconductor memory systems.
ECC402.3	Explain architecture of 8051 using block diagram, pin diagram and programming model.
ECC402.4	Write 8051 assembly language programs and interfacing programs.
ECC402.5	Explain ARM7 using block diagram, pin diagram and programming model.
ECC402.6	Describe applications of 8 bit microcontrollers namely NXP 89v51RD2, Atmega 328P and PIC16F886.
Course Name: ECC403 Linear Integrated Circuits Year of Study: 2023-24	
ECC403.1	Understand fundamental properties of operational amplifiers.

ECC403.2	To analyze linear application of operational amplifier.
ECC403.3	To analyze non-linear application of operational amplifier.
ECC403.4	To understand 555 timer IC & its application.
ECC403.5	To explain concept of voltage regulator.
ECC403.6	To explain special purpose integrated circuit.
Course Name: ECC404 Signals & Systems Year of Study: 2023-24	
ECC 404.1	**Classify and Analyse Different types of signal and systems.**
ECC 404.2	**Analyze continuous time LTI signals and systems in transform domain.**
ECC 404.3	**Analyze and realize discrete time LTI signals and systems in transform domain.**
ECC 404.4	**Represent Signals and systems using Fourier Series and Analyze the systems using the Fourier transform.**
ECC 404.5	**Analyse the signals and systems using Laplace Transform and z-transform.**
ECC 404.6	**Demonstrate the concept learnt in signals and systems course using the modern engineering tools.**
Course Name: ECC405 Principles of Communication Engineering Year of Study: 2023-24	
ECC405.1	**Understand the basic components and types of noises in communication system.**

ECC405.2	**Analyze the concepts of amplitude modulation and demodulation.**
ECC405.3	**Analyze the concepts of angle modulation and demodulation.**
ECC405.4	**Compare the performance of AM and FM receivers.**
ECC405.5	**Describe analog and digital pulse modulation techniques.**
ECC405.6	**Illustrate the principles of multiplexing and demultiplexing techniques**
Course Name: ECL401 Microcontrollers Laboratory Year of Study: 2023-24	
ECL401.1	Study editor, assembler, cross assembler, compiler, cross compiler, linker, simulator, emulator development tools
ECL401.2	Write 8051 assembly language programs for arithmetic and logical operations, code conversion and data transfer operations.
ECL401.3	Write 8051 assembly language programs for general purpose I/O, Timers and interrupts
ECL401.4	Interface 8051 with Input output devices and write programs for it.
ECL401.5	Develop microcontroller based applications using NXP 89v51RD2, Atmega328P and PIC16F886 .
Course Name: ECL402 Linear Integrated Circuits Laboratory Year of Study: 2023-24	
ECL402.1	Describe the fundamentals properties of Operational Amplifier
ECL402.2	Analyze Operational Amplifier as Inverting, Noninverting adder, subtractor, differentiator, integrator

ECL402.3	Analyze Linear & Nonlinear application of operational Amplifier
ECL402.4	Describe the functioning voltage regulator & IC 555 timer
Course Name: ECL403 Principles of Communication Engineering Laboratory Year of Study: 2023-24	
ECL403.1	Understand the concept of noise and its measurement in communication.
ECL403.2	Analyze amplitude and angle modulation and demodulation techniques used in analog communication
ECL403.3	Analyze analog pulse modulation and demodulation techniques used in analog communication
ECL403.4	Analyze transmitter and receiver circuits used for analog communication
ECL403.5	Understand multiplexing and de-multiplexing of signals and their need in communication
Course Name: ECL404 SKILL LAB :Python Programming Year of Study: 2023-24	
ECL404.1	Describe the numbers, math functions, strings, list, tuples and dictionaries in Python
ECL404.2	Demonstrate Functions and File handling operations
ECL404.3	Interpret Object oriented programming in Python
ECL404.4	Demonstrate GUI Applications and different database operations in python
ECL404.5	Design Mathematical Functions of NumPy array, Data frame

ECL404.6	Design Support Vector Machines
Course Name: ECM401 Mini Project 1-B **Year of Study: 2023-24**	
ECM401.1	Write basic codes for the Arduino board using the IDE for utilizing the onboard resources.
ECM401.2	Apply the knowledge of interfacing different devices to the Arduino board to accomplish a given task.
ECM401.3	Design Arduino based projects for a given problem.
ECM401.4	Write code using python language using IDE for utilizing the onboard resources.
ECM401.5	Apply the knowledge of interfacing different devices to raspberry Pi board to accomplish a given task.
ECM401.6	Design Raspberry Pi based projects for a given problem.
Course Name: ECC501 Digital Communication **Year of Study: 2023-24**	
ECC501.1	Understand the basics of digital communication, probability theory.
ECC501.2	Apply fundamental concept of information theory in source coding.
ECC501.3	Understand the basics of significance of line coding in digital communication
ECC501.4	Evaluate the effect of ISI on digital communication system
ECC501.5	Compare bandpass modulation and baseband modulation techniques.

ECC501.6	Evaluate performance of error control codes.
Course Name: ECC502 Discrete Time Signal Processing Year of Study: 2023-24	
ECC502.1	Understand the concepts of discrete-time Fourier transform and fast Fourier transform.
ECC502.2	Apply the knowledge of design of IIR digital filters to meet arbitrary specifications.
ECC502.3	Apply the knowledge of design of FIR digital filters to meet arbitrary specifications.
ECC502.4	Apply the knowledge of DSP processors for various applications.
ECC502.5	Design and simulate digital filters
ECC502.6	Apply algorithms of DSP for real time applications
Course Name: ECC503 Digital VLSI Year of Study: 2023-24	
ECC503.1	Know various tools and processes used in VLSI Design.
ECC503.2	Explain working of various CMOS combinational and sequential circuits used in VLSI Design.
ECC503.3	Derive expressions for performance parameters of basic building blocks like CMOS inverter.
ECC503.4	Relate performance parameters with design parameters of VLSI circuits.
ECC503.5	Select suitable circuit and design style for given application.

ECC503.6	Design and realize various combinational and sequential circuits for given specifications.
Course Name: ECC504 Random Signal Analysis	**Year of Study: 2023-24**
ECC504.1	Apply theory of probability in identifying and solving relevant problems
ECC504.2	Differentiate continuous and discrete random variables and their distributions.
ECC504.3	Analyze mean, variance, and distribution function of random variables and functions of random variables
ECC504.4	Understand the concept of Multiple Random Variables and Central Limit Theorem
ECC504.5	Define a random process, determine the type of the process and find the response of LTI system for WSS process.
ECC504.6	Explain linear regression algorithms and apply the same for predictive applications.
Course Name: ECCDLO5014 Data Structures and Algorithm	**Year of Study: 2023-24**
ECCDLO5014 .1	Compare functions using asymptotic analysis and describe the relative merits of worst-, average-, and best-case analysis
ECCDLO5014 .2	Apply various operations on Stack and Queue
ECCDLO5014 .3	Ability to demonstrate the operation of Linked list and apply it.
ECCDLO5014 .4	Ability to demonstrate and apply Trees & Graph data structures.
ECCDLO5014 .5	Become familiar with various Sorting and Searching Algorithms and their performance characteristics.

ECCDLO5014 .6	Describe the hash function and concepts of collision and its resolution methods
Course Name: ECL501 Digital Communication Lab **Year of Study: 2023-24**	
ECL501.1	Understand the basics of digital signal and significance of line coding in digital communication
ECL501.2	Apply fundamental concept of information theory in source coding
ECL501.3	Evaluate the effect of ISI on digital communication system
ECL501.4	Compare band pass modulation techniques
ECL501.5	Evaluate performance of error control codes
Course Name: ECL502 Discrete Time Signal Processing Lab **Year of Study: 2023-24**	
ECL502 .1	Understand the relation between different transforms
ECL502 .2	Understand the concepts of discrete-time Fourier transform, fast Fourier transform and apply in system analysis
ECL502 .3	Design digital IIR and FIR filters to satisfy the given specifications and evaluate the frequency response and polezero representations
ECL502 .4	Interpret the different realization structures of Digital IIR and FIR filters.
ECL502 .5	Analyze the impact of hardware limitations on the performance of digital filters
Course Name: ECL503 Digital VLSI Lab **Year of Study: 2023-24**	

ECL503.1	Write spice code for given combinational and sequential CMOS circuits.
ECL503.2	Perform various analysis like operating point, dc, transient etc of given CMOS circuits.
ECL503.3	Evaluate performance of given CMOS circuits
ECL503.4	Draw layout of given CMOS circuit and also able extract various parasitic using open source layout tool like Magic
ECL503.5	Design, simulate, and verify CMOS circuit for given specifications.

Course Name: ECL504 Professional Communication & Ethics-II Lab   Year of Study: 2023-24

ECL504.1	plan and prepare effective business/ technical documents which will in turn provide solid foundation for their future managerial roles.
ECL504.2	strategize their personal and professional skills to build a professional image and meet the demands of the industry.
ECL504.3	emerge successful in group discussions, meetings and result-oriented agreeable solutions in group communication situations.
ECL504.4	deliver persuasive and professional presentations.
ECL504.5	develop creative thinking and interpersonal skills required for effective professional communication.
ECL504.6	apply codes of ethical conduct, personal integrity and norms of organizational behaviour.

Course Name: ECM501 Mini Project 2AEmbedded System Project   Year of Study: 2023-24

ECM501.1	Understand the embedded systems with design metrics

ECM501.2	Understand microcontrollers and programming in Embedded C.
ECM501.3	Implementation of Embedded systems with different sensors and peripherals as IoT.
ECM501.4	Implementation of Embedded systems with different communication protocols as IoT.
ECM501.5	Analyze concepts of Real time operating systems
ECM501.6	Design embedded system applications using sensors, peripherals and RTOS
Course Name: ECC601 Electromagnetics and Antenna **Year of Study: 2023-24**	
ECC601.1	To describe electromagnetics fields including static and dynamic in terms of Maxwell's equations.
ECC601.2	To apply Maxwell's equation to solve various electromagnetic phenomena such as electromagnetic wave propagation in different mediums, power in EM waves.
ECC601.3	To derive the field equations for the basic radiating elements and describe basic antenna parameters like radiation pattern, directivity, gain etc
ECC601.4	Analyze Antenna Arrays (Linear Planar and Circular)
ECC601.5	Implement different types of the antenna structures such as Special Antenna(Yagi Uda, Log periodic, Helical, Microstrip antenna, Horn antenna and reflector antenna.
ECC601.6	Compare Ground Wave, Space wave and Sky wave (Electromagnetic Wave) Propagation
Course Name: ECC602 Computer Communication Networks **Year of Study: 2023-24**	
ECC602.1	Analyze network topologies, hardware devices, addressing schemes and the protocol stacks

ECC602.2	Compare various transmission media and broadband technologies
ECC602.3	Analyze the flow control, error control and the medium access control techniques.
ECC602.4	Judge network layer addressing and routing schemes.
ECC602.5	Analyze connection oriented and connectionless services.
ECC602.6	Apply the knowledge of application layer protocols
Course Name: ECC603 Image Processing and Machine Vision Year of Study: 2023-24	
ECC603.1	Understand fundamentals of image processing and machine vision
ECC603.2	Able to enhance the quality of image using spatial and frequency domain techniques for image enhancement
ECC603.3	Able to apply image morphology and restoration techniques
ECC603.4	Able to perform image segmentation techniques based on principle of discontinuity and similarity using various algorithms
ECC603.5	Able to represent boundaries and shapes using standard techniques
ECC603.6	Able to classify the object using different classification methods
Course Name: ECC604 Artificial Neural Network and Fuzzy Logic Year of Study: 2023-24	
ECC604.1	Comprehend the concepts of biological neurons and artificial neurons

ECC604.2	Analyze the feed-forward and feedback neural networks and their learning algorithms.
ECC604.3	Comprehend the neural network training and design concepts
ECC604.4	Build a simple CNN model and apply in image classification
ECC604.5	Analyze the application of neural networks and fuzzy logic to real world problems.
Database Management System	
ECCDLO6014.1	Describe the fundamentals of database systems, different data models and design issues in database
ECCDLO6014.2	Understand the basics model of relational Algebra, calculus, transaction management, concurrency control , database security and privacy
ECCDLO6014.3	Design ER diagram, relational schemas, apply concepts of normalization to relational database design
ECCDLO6014.4	Learning the programming languages of SQL
ECCDLO6014.5	Applying the concepts of normalization
ECCDLO6014.6	Implement views, triggers and querying the database using SQL.
Electromagnetics and Antenna Lab	
ECL601.1	Design various wire antennas like dipole , monopole, loop antenna
ECL601.2	Design of Broadband Antenna like Helical Antenna

ECL601.3	Analyze antenna arrays of isotropic or directional Sources.
ECL601.4	Analysis of Reflectors Antenna
ECL601.5	Measure various parameters (for e.g. HPBW, FBR, Gain etc.) for various antennas
Computer Communication Networks Lab	
ECL602.1	Design a small or medium sized computer network including media types, end devices, and interconnecting devices that meets a customer 's specific needs.
ECL602.2	Perform basic configurations on routers and Ethernet switches.
ECL602.3	Demonstrate knowledge of programming for network communications.
ECL602.4	Simulate computer networks and analyze the simulation results.
ECL602.5	Troubleshoot connectivity problems in a host occurring at multiple layers of the OSI model.
ECL602.6	Develop knowledge and skills necessary to gain employment as computer network engineer and network administrator
Image Processing and Machine Vision Lab	
ECL603.1	Perform enhancement of digital images in spatial and frequency domain
ECL603.2	Perform edge detection and morphological operations on digital images

ECL603.3	Classify patterns using standard Machine vision classification techniques like SVM
ECL603.4	Apply theoretical knowledge in image processing and machine vision to practical case studies
Skill Lab: Linux and Networking and Server Configuration	
ECL604.1	Install Linux using different platform and execute standard Linux commands.
ECL604.2	Describe the basic knowledge of Linux Operating System
ECL604.3	Deploy the system administrative functionality
ECL604.4	Solve the problems using shell script programming
ECL604.5	Develop network based applications
ECL604.6	Apply the Linux commands using programming skill to deploy different servers like FTP, TELNET etc.
Course Name: ECC701 Microwave Engineering Year of Study: 2023-24	
ECC701.1	Design Single or Double Stub Matching Network using Smith Chart for transmission lines.
ECC701.2	Describe the types of waveguides, rectangular waveguides and field patterns
ECC701.3	Understand the coupling mechanisms in waveguides and analyze the waveguide multiport junctions.
ECC701.4	Explore the microwave linear tubes and analyze with microwave cross field tubes.

ECC701.5	Understand the microwave solid state devices and avalanche transit time devices.
ECC701.6	Demonstrate the microwave bench set up and conducting measurements of different parameter
Course Name:ECC702 Mobile Communication System Year of Study: 2023-24	
ECC702.1	Apply cellular fundamentals and evaluate the coverage and capacity of cellular systems.
ECC702.2	Apply the different types of propagation models and analyze the link budget.
ECC702.3	Analyze and contrast GSM, GPRS, HSCSD, EDGE and IS-95 technologies.
ECC702.4	Apply the concepts of 3G technologies for UMTS and CDMA 2000.
ECC702.5	Create parameters & standardization of 3GPP LTE & advanced LTE.
ECC702.6	Analyze the emerging technologies for upcoming mobile communication systems.
Course Name: ECCDLO 7013 Cloud Computing and Security Year of Study: 2023-24	
ECCDLO 7013.1	Explain the fundamentals of cloud computing.
ECCDLO 7013.2	Interpret the significance of virtualization in the context of cloud computing
ECCDLO 7013.3	Describe cloud computing services working on AWS, Azure and Google cloud platforms
ECCDLO 7013.4	Explain application design aspects of cloud computing

ECCDLO 7013.5	Interpret security aspects to cloud computing.
ECCDLO 7013.6	Explain advances in cloud computing in terms of multimedia cloud, fog, edge computing and real applications of cloud.
Course Name:ECCDLO 7014 Big Data Analytics Year of Study: 2023-24	
ECCDLO 7014.1	Explain fundamentals of Big data analytics.
ECCDLO 7014.2	Explain how Hadoop framework can be used solve big data analytics problems.
ECCDLO 7014.3	Explain use of No SQL to handle big data analytics problems.
ECCDLO 7014.4	Apply Map reduce techniques to handle big data analytics problems.
ECCDLO 7014.5	Explain use of big data analytics techniques in finding similar items, mining data streams, link analysis and frequent itemset mining.
ECCDLO 7014.6	Explain applications of big data analytics in recommendation systems and mining social network graphs.
Course Name: ECL701 Microwave Engineering Laboratory Year of Study: 2023-24	
ECL701.1	Design Single or Double Stub Matching Network using Smith Chart for transmission lines.
ECL701.2	Describe the types of waveguides, rectangular waveguides and field patterns
ECL701.3	Understand the coupling mechanisms in waveguides and analyze the waveguide multiport junctions.
ECL701.4	Explore the microwave linear tubes and analyze with microwave cross field tubes.

ECL701.5	Understand the microwave solid state devices and avalanche transit time devices.
ECL701.6	Demonstrate the microwave bench set up and conducting measurements of different parameter

Course Name: ECL702 Mobile Communication System Laboratory	Year of Study: 2023-24

ECL702.1	Apply the fundamentals of Mobile communication system to design the Wireless networks & evaluate system capacity.
ECL702.2	Apply radio propagation path loss & calculate spectral efficiency of TDMA.
ECL702.3	Apply the number of PN bits, processing gain in DSSS system and find capacity of IS-95
ECL702.4	Evaluate various parameters for GSM 1800 networks & understand the handover mechanism.
ECL702.5	Evaluate the effects of cluster size on S/I & GSM frame structure.
ECL702.6	Create the mobile communication based mini project for various applications using software on 3 rd Generation & the ~~Emerging Technology required for 4th Generation mobile systems~~

Course Name: ECP701 Major Project-I	Year of Study: 2023-24

ECP701.1	Apply Engineering Knowledge and concepts to arrive at design solutions for a given problem.
ECP701.2	Analyze engineering problem using research literature to find gaps in existing knowledge.
ECP701.3	Apply research-based knowledge and design experiments to solve an engineering problem
ECP701.4	Identify the end user that shall benefit through the proposed solution of system and also demonstrate concern for environment and abide by professional ethics.

ECP701.5	Demonstrate teamwork and communication principles while planning projects, writing reports and giving presentations.
ECP701.6	Apply project life cycle principles by project scheduling and managing finances.
Course Name: ECCDLO 7023 Internet Communication Engineering Year of Study: 2023-24	
ECCDLO 7023 .1	Compare the protocols at each layer of TCP/IP protocol suite
ECCDLO 7023 .2	Explain the internet security aspects of protocols at various layers of TCP/IP protocol suite
ECCDLO 7023 .3	Apply the various compression algorithms for audio, image & video coding.
ECCDLO 7023 .4	Categorize and design simple networked multimedia systems
ECCDLO 7023 .5	Compare integrated & differentiated services for quality of service.
ECCDLO 7023 .6	Explain a software defined Network.
Course Name: ECC801 Optical Communication and Networks Year of Study: 2023-24	
ECC801.1	To understand types of fibers, cables and deployment, fundamental principles of optics and light wave, fabrication, techniques for optical fiber communication.
ECC801.2	Apply dispersion & transmission losses in the optical fiber, communication with linear and nonlinear effects in fiber.
ECC801.3	Evaluate parameters for optical link power budget and rise time budget to analyze the link using various optical sources & detectors.
ECC801.4	Analyze optical networks system components & optical networks with SONET/SDH,PDH.

ECC801.5	Analyze optical networks using packet switching & access networks.
ECC801.6	Analyze transmission system model using network design and management.
Course Name: ECL801 Optical Communication and Networks Laboratory Year of Study: 2023-24	
ECL801.1	Apply setting up analog & digital optical fiber waveguide to find fiber parameters and Numerical Aperture (NA) in optical fiber
ECL801.2	Apply transmission characteristics to find losses in optical fiber link intensity modulation technique.
ECL801.3	Apply of optical power & fiber voice optical link using intensity modulation.
ECL801.4	Evaluate link power & rise time budget for the optical link with given parameters.
ECL801.5	--
Course Name: ECP801 Major Project-II Year of Study: 2023-24	
ECP801 .1	Implement project using modern tools and techniques with latest hardware and software
ECP801 .2	Design project which solves research problem identifies by reviewing literature.
ECP801 .3	Demonstrate teamwork and communication principles while planning projects, writing reports and giving presentations.
ECP801 .4	Apply project life cycle principles by project scheduling and managing finances.
ECP801 .5	Understand project as an experience for lifelong learning in the field of technology by being able to engage in independent study of design solutions and implementation.

ECP801 .6	Design a project/product which will be useful to the society addressing environment concerns and abiding by ethical principles.
Course Name: ECCDLO 8014 Web Design Year of Study: 2023-24	
ECCDLO 8014.1	Explain web system archtecture and Internet protocols
ECCDLO 8014.2	Design web pages using HTML5 and CSS3 and Javascript.
ECCDLO 8014.3	Build responsive web pages using front-end framework Bootstrap.
ECCDLO 8014.4	Develop a web application using appropriate web development framework.
ECCDLO 8014.5	Apply the concepts of server-side programming using Laravel, PHP and AJAX.
ECCDLO 8014.6	Explain working of web services and architecture SOAP and REST
Course Name: ECCDLO 8025 Augmented Reality and Virtual Reality Year of Study: 2023-24	
ECCDLO 8025.1	Identify and compare different Virtual and Augmented Reality Technologies and apply modeling techniques.
ECCDLO 8025.2	Identify and use AR-VR hardware components.
ECCDLO 8025.3	Apply concepts of Computer Vision for tracking in AR Systems.
ECCDLO 8025.4	Apply calibration techniques and registration for components in AR.
ECCDLO 8025.5	Design AR-VR application

ECCDLO 8025.6	Apply insights of AR-VR in different applications.

Course outcomes A. Y. 2023-24

Department Name : Information Technology
SECOND YEAR- III SEM

Engineering Mathematics-III

Course Code : ITC301

Course	Course/Lab Outcomes
	After the completion of the course the student should be able to
ITC301.1	Apply the concept of Laplace transform to solve the real integrals in
ITC301.2	Apply the concept of inverse Laplace transform of various functions in
ITC301.3	Expand the periodic function by using Fourier series for real life problems and
ITC301.4	Find orthogonal trajectories and analytic function by using basic concepts of
ITC301.5	Apply the concept of Correlation and Regression to the engineering
ITC301.6	Illustrate understanding of the concepts of probability and expectation for

Department Name : Information Technology
Subject Name : Data Structure and Analysis
Course Code : ITC302

Course	Course/Lab Outcomes
	After the completion of the course the student should be able to
ITC302.1	Classify and Apply the concepts of stacks, queues and linked list in real life problem solving.
ITC302.2	Classify, apply and analyze the concepts trees in real life problem solving.
ITC302.3	Illustrate and justify the concepts of graphs in real life problem solving.
ITC302.4	List and examine the concepts of sorting, searching techniques in real life problem solving.
ITC302.5	Use and identify the concepts of recursion, hashing in real life problem solving
ITC302.6	Examine and justify different methods of stacks, queues, linked list, trees and graphs to various applications.

Department Name : Information Technology
Subject Name : Database Management System
Course Code : ITC303

Course	Course/Lab Outcomes

	After the completion of the course the student should be able to
ITC303.1	Identify the need of Database Management System.
ITC303.2	Design conceptual model for real life applications.
ITC303.3	Create Relational Model for real life applications
ITC303.4	Formulate query using SQL commands.
ITC303.5	Apply the concept of normalization to relational database design.
ITC303.6	Demonstrate the concept of transaction, concurrency and recovery.

Subject Name : Principle of Communication	
Course Code : ITC304	
Course	**Course/Lab Outcomes**
After the completion of the course the student should be able to	
ITC304.1	Describe analog and digital communication systems
ITC304.2	Differentiate types of noise, analyses the Fourier transform of time and
ITC304.3	Design transmitter and receiver of AM, DSB, SSB and FM.
ITC304.4	Describe Sampling theorem and pulse modulation systems.
ITC304.5	Explain multiplexing and digital band pass modulation techniques.
ITC304.6	Describe electromagnetic radiation and propagation of waves.

Subject Name : Principle of Communication	
Course Code : ITC305	
Course	**Course/Lab Outcomes**
After the completion of the course the student should be able to	
ITC305.1	Understand and Compare different programming paradigms.
ITC305.2	Understand the Object Oriented Constructs and use them in program design.
ITC305.3	Understand the concepts of declarative programming paradigms through functional and logic programming.
ITC305.4	Design and Develop programs based on declarative programming paradigm using functional and/or logic programming.
ITC305.5	Understand the role of concurrency in parallel and distributed programming.
ITC305.6	Understand different application domains for use of scripting languages.

Subject Name : Data Structure Lab
Course Code :ITL301

Course	Course/Lab Outcomes
	After the completion of the course the student should be able to
ITL301.1	Understand and use the basic concepts and principles of various linked lists, stacks and queues.
ITL301.2	Understand the concepts and apply the methods in basic trees.
ITL301.3	Use and identify the methods in advanced trees.
ITL301.4	Understand the concepts and apply the methods in graphs.
ITL301.5	Understand the concepts and apply the techniques of searching, hashing and sorting
ITL301.6	Illustrate and examine the methods of linked lists, stacks, queues, trees and graphs to various real time problems

Subject Name : SQL Lab	
Course Code : ITL302	
Course	Course/Lab Outcomes
	After the completion of the course the student should be able to
ITL301.1	Define problem statement and Construct the conceptual model for real life application.
ITL301.2	Create and populate a RDBMS using SQL.
ITL301.3	Formulate and write SQL queries for efficient information retrieval
ITL301.4	Apply view, triggers and procedures to demonstrate specific event handling
ITL301.5	Demonstrate database connectivity using JDBC.
ITL301.6	Demonstrate the concept of concurrent transactions.

Department Name : Information Technology	
Subject Name : Computer programming	
Course Code :ITL303	
Course	Course/Lab Outcomes
	After the completion of the course the student should be able to
ITL303.1	Implement Object Oriented concepts in C++.
ITL303.2	Design and Develop solution based on declarative programming paradigm using functional and logic programming.
ITL303.3	Understand the multi threaded programs in Java and C++
ITL303.4	Understand the need and use of exception handling and garbage collection in C++ and JAVA
ITL303.5	Implement a solution to the same problem using multiple paradigms.
ITL303.6	Compare the implementations in multiple paradigms at coding and L4 execution level.

Department Name : Information Technology	
Subject Name : Java Lab	
Course Code : ITL304	
Course	**Course/Lab Outcomes**
	After the completion of the course the student should be able to
ITL304.1	Explain the fundamental concepts of Java Programing.
ITL304.2	Use the concepts of classes, objects, members of a class and the relationships among them needed for a finding the solution to specific problem
ITL304.3	Demonstrate how to extend java classes and achieve reusability using Inheritance, Interface and Packages.
ITL304.4	Construct robust and faster programmed solutions to problems using concept of Multithreading, exceptions and file handling
ITL304.5	Design and develop Graphical User Interface using Abstract Window Toolkit and Swings along with response to the events.
ITL304.6	Develop Graphical User Interface by exploring JavaFX framework based on MVC architecture.

Subject Name : Mini Project – 1 A for Front end /backend Application using JAVA	
Course Code : ITL305	
Course	**Course/Lab Outcomes**
	After the completion of the course the student should be able to
ITL305.1	Identify the problems based on societal/research needs
ITL305.2	Conduct a survey of several available literature in the preferred field of study
ITL305.3	Formulate and propose a plan for creating a solution for the research plan identified
ITL305.4	Apply Knowledge, skill and draw inference to solve societal problems in a group
ITL305.5	Demonstrate an ability to work in teams and manage the conduct of the research study.
ITL305.6	To report and present the findings of the study conducted in the preferred domain

SECOND YEAR- IV SEM	
Subject Name : Engineering Mathematics-IV	
Course Code : ITC401	
Course	**Course/Lab Outcomes**
	After the completion of the course the student should be able to
ITC401.1	Apply the concepts of eigen values and eigen vectors to solve engineering problems.
ITC401.2	Illustrate the use of concepts of Complex Integration for evaluating integrals, computing residues & evaluate various contour
ITC401.3	Apply the concept of Z- transformation and its inverse in engineering problems.
ITC401.4	Apply the concept of probability distribution to engineering problems & testing hypothesis of small samples using sampling

ITC401.5	Apply the concept of Linear Programming to solve the optimization problems
ITC401.6	Use the Non-Linear Programming techniques to solve the optimization problems.

Subject Name : Computer Network and Network Design	
Course Code : ITC402	
Course	**Course/Lab Outcomes**
After the completion of the course the student should be able to	
ITC402.1	Describe the functionalities of each layer of the models and compare the Models.
ITC402.2	Categorize the types of transmission media and explain data link layer concepts, design issues and protocols.
ITC402.3	Analyze the routing protocols and assign IP address to networks.
ITC402.4	Explain the data transportation and session management issues and related protocols used for end to end delivery of data.
ITC402.5	List the data presentation techniques and illustrate the client/server model in application layer protocols.
ITC402.6	Use of networking concepts of IP address, Routing, and application services to design a network for an organization

Subject Name : Operating System	
Course Code : ITC403	
Course	**Course/Lab Outcomes**
After the completion of the course the student should be able to	
ITC403.1	To understand the major components of Operating System &its functions.
ITC403.2	To introduce the concept of a process and its management like transition, scheduling, etc.
ITC403.3	To understand basic concepts related to Inter-process Communication (IPC) like mutual exclusion, deadlock, etc. and role of an
ITC403.4	To understand the concepts and implementation of memory management policies and virtual memory.
ITC403.5	To understand functions of Operating System for storage management and device management.
ITC403.6	To study the need and fundamentalsof special-purpose operating system with the advent of new emerging technologies

Department Name : Information Technology	
Subject Name : Automata Theory	
Course Code : ITC404	
Course	**Course/Lab Outcomes**
After the completion of the course the student should be able to	
ITC404.1	Explain, analyze and design Regular languages, Expression and Grammars.
ITC404.2	Design different types of Finite Automata and Machines as Acceptor, Verifier and Translator

ITC404.3	Analyze and design Context Free languages and Grammars.
ITC404.4	Design different types of Push down Automata as Simple Parser.
ITC404.5	Design different types of Turing Machines as Acceptor, Verifier, Translator and Basic computing machine.
ITC404.6	Develop understanding of applications of various Automata.

Subject Name : Computer Organization and Architecture	
Course Code :ITC405	
Course	**Course/Lab Outcomes**
After the completion of the course the student should be able to	
ITC405.1	Learn the fundamentals of Digital Logic Design.
ITC405.2	Conceptualize the basics of organizational and features of a digital computer.
ITC405.3	Study microprocessor architecture and assembly language programming.
ITC405.4	Study processor organization and parameters influencing performance of a processor.
ITC405.5	Analyse various algorithms used for arithmetic operations.
ITC405.6	Study the function of each element of memory hierarchy and various data transfer techniques used in digital computer.

Subject Name : Networking Lab	
Course Code :ITL401	
Course	**Course/Lab Outcomes**
After the completion of the course the student should be able to	
ITL401.1	Execute and evaluate network administration commands and demonstrate their use in different network scenarios
ITL401.2	Demonstrate the installation and configuration of network simulator.
ITL401.3	Demonstrate and measure different network scenarios and their performance behavior.
ITL401.4	Implement the socket programming for client server architecture.
ITL401.5	Analyze the traffic flow of different protocols
ITL401.6	Design a network for an organization using a network design tool

Subject Name : Unix Lab	
Course Code : ITL402	
Course	**Course/Lab Outcomes**
After the completion of the course the student should be able to	

ITL402.1	Understand the architecture and functioning of Unix
ITL402.2	Identify the Unix general purpose commands
ITL402.3	Apply Unix commands for system administrative tasks such as file system management and user management.
ITL402.4	Execute Unix commands for system administrative tasks such as process management and memory management
ITL402.5	Implement basic shell scripts for different applications
ITL402.6	Implement advanced scripts using awk & perl languages and grep, sed, etc. commandsfor performing various tasks.

Subject Name : Microprocessor Lab	
Course Code : ITL403	
Course	Course/Lab Outcomes
After the completion of the course the student should be able to	
ITL403.1	Demonstrate various components and peripheral of computer system
ITL403.2	Analyze and design combinational circuits
ITL403.3	Build a program on a microprocessor using arithmetic & logical instruction set of 8086.
ITL403.4	Develop the assembly level programming using 8086 loop instruction set
ITL403.5	Write programs based on string and procedure for 8086 microprocessor.
ITL403.6	Design interfacing of peripheral devices with 8086 microprocessor.

Subject Name : Python Lab (SBL)	
Course Code : ITL404	
Course	Course/Lab Outcomes
After the completion of the course the student should be able to	
ITL404.1	Understand the structure, syntax, and semantics of the Python language.
ITL404.2	Interpret advanced data types and functions in python
ITL404.3	illustrate the concepts of object-oriented programming as used in Python
ITL404.4	Create Python applications using modules, packages, multithreading and exception handling.
ITL404.5	Gain proficiency in writing File Handling programs ,also create GUI applications and evaluate database operations in python.
ITL404.6	Design and Develop cost-effective robust applications using the latest Python trends and technologies

THIRD YEAR- V SEM

Subject Name : Internet Programming	
Course Code :ITC501	
Course	Course/Lab Outcomes
After the completion of the course the student should be able to	
ITC501.1	Select protocols or technologies required for various web applications.
ITC501.2	Apply JavaScript to add functionality to web pages
ITC501.3	Design front end application using basic React.
ITC501.4	Design front end applications using functional components of React.
ITC501.5	Design back-end applications using Node.js.
ITC501.6	Construct web based Node.js applications using Express.

Subject Name : Compute Network Security	
Course Code : ITC502	
Course	Course/Lab Outcomes
After the completion of the course the student should be able to	
ITC502.1	Explain the fundamentals concepts of computer security and network security
ITC502.2	Identify the basic cryptographic techniques using classical and block encryption methods.
ITC502.3	Study and describe the system security malicious software.
ITC502.4	Describe the Network layer security, Transport layer security and application layer security
ITC502.5	Explain the need of network management security and illustrate the need for NAC
ITC502.6	Identify the function of an IDS and firewall for the system security

Subject Name : Entrepreneurship and E- business	
Course Code : ITC503	
Course	Course/Lab Outcomes
After the completion of the course the student should be able to	
ITC503.1	Understand the concept of entrepreneurship and its close relationship with enterprise and owner-management.
ITC503.2	Understand the nature of business development in the context of existing organizations and of new business start-ups.
ITC503.3	Comprehended important factors for starting a new venture and business development
ITC503.4	Know issues and decisions involved in financing and resourcing a business start-up
ITC503.5	Describe various E-business Models
ITC503.6	Discuss various E-business Strategies

Subject Name : Software Engineering	
Course Code : ITC504	
Course	**Course/Lab Outcomes**
	After the completion of the course the student should be able to
ITC504.1	Understand and use basic knowledge in software engineering.
ITC504.2	Identify requirements, analyze and prepare models.
ITC504.3	Plan, schedule and track the progress of the projects.
ITC504.4	Design & develop the software solutions for the growth of society
ITC504.5	To demonstrate and evaluate real time projects with respect to software engineering principles
ITC504.6	Apply testing and assure quality in software solution

Subject Name : IP Lab	
Course Code : ITL501	
Course	**Course/Lab Outcomes**
	After the completion of the course the student should be able to
ITL501.1	Identify and apply the appropriate HTML tags to develop a webpage
ITL501.2	Identify and apply the appropriate CSS tags to format data on webpage
ITL501.3	Construct responsive websites using Bootstrap
ITL501.4	Use JavaScript to develop interactive web pages.
ITL501.5	Construct front end applications using React
ITL501.6	Construct back end applications using Node.js/Express

Subject Name : Security Lab	
Course Code : ITL502	
Course	**Course/Lab Outcomes**
	After the completion of the course the student should be able to
ITL502.1	Illustrate symmetric cryptography by implementing classical ciphers.
ITL502.2	Demonstrate Key management, distribution and user authentication.
ITL502.3	Explore the different network reconnaissance tools to gather information about networks
ITL502.4	Use tools like sniffers, port scanners and other related tools for analyzing packets in a network.
ITL502.5	Use open-source tools to scan the network for vulnerabilities and simulate attacks

ITL502.6	Demonstrate the network security system using open source tools

Subject Name : Devops Lab	
Course Code : ITL503	
Course	**Course/Lab Outcomes**
After the completion of the course the student should be able to	
ITL503 .1	To understand the fundamentals of DevOps engineering and be fully proficient with DevOps terminologies, concepts, benefits, and deployment options to meet your business requirements
ITL503 .2	To obtain complete knowledge of the "version control system" to effectively track changes augmented with Git and GitHub
ITL503 .3	To understand the importance of Jenkins to Build and deploy Software Applications on server environment
ITL503 .4	Understand the importance of Selenium and Jenkins to test Software Applications
ITL503 .5	To understand concept of containerization and Analyze the Containerization of OS images and deployment of applications over
ITL503 .6	To Synthesize software configuration and provisioning using Ansible.

Subject Name : Advance DevOps Lab	
Course Code : ITL504	
Course	**Course/Lab Outcomes**
After the completion of the course the student should be able to	
ITL504.1	To understand the fundamentals of Cloud Computing and be fully proficient with Cloud based DevOps solution deployment options to meet your business requirements
ITL504.2	To deploy single and multiple container applications and manage application deployments with rollouts in Kubernetes
ITL504.3	To apply best practices for managing infrastructure as code environments and use terraform to define and deploy cloud infrastructure.
ITL504.4	To identify and remediate application vulnerabilities earlier and help integrate security in the development process using SAST Techniques.
ITL504.5	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
ITL504.6	To engineer a composition of nano services using AWS Lambda and Step Functions with the Serverless Framework

THIRD YEAR- VI SEM
Subject Name : Data Mining & Business Intelligence
Course Code : ITC601

Course	Course/Lab Outcomes
	After the completion of the course the student should be able to
ITC601.1	Demonstrate an understanding of the importance of data warehousing and data mining and the principles of business
ITC601.2	Organize and prepare the data needed for data mining using pre preprocessing techniques.
ITC601.3	Perform exploratory analysis of the data to be used for mining
ITC601.4	Implement the appropriate data mining methods like classification, clustering or Frequent Pattern mining on large data sets
ITC601.5	Define and apply metrics to measure the performance of various data mining algorithms.
ITC601.6	Apply BI to solve practical problems: Analyze the problem domain, use the data collected in enterprise apply the appropriate

Subject Name : Web X.0
Course Code : ITC602

Course	Course/Lab Outcomes
	After the completion of the course the student should be able to
ITC602.1	Understand the basic concepts related to web analytics and semantic web.
ITC602.2	Understand how TypeScript can help you eliminate bugs in your code and enable you to scale your code.
ITC602.3	Understand AngularJS framework and build dynamic, responsive single-page web applications
ITC602.4	Apply MongoDB for frontend and backend connectivity using REST API
ITC602.5	Apply Flask web development framework to build web applications with less code
ITC602.6	Develop Rich Internet Application using proper choice of Framework.

Subject Name : Wireless Technology
Course Code :ITC603

Course	Course/Lab Outcomes
	After the completion of the course the student should be able to
ITC603.1	Describe the basic concepts of Wireless Network and Wireless Generations.
ITC603.2	Demonstrate and Evaluate the various Wide Area Wireless Technologies.
ITC603.3	Analyze the prevalent IEEE standards used for implementation of WLAN and WMAN Technologies
ITC603.4	Appraise the importance of WPAN, WSN and Ad-hoc Networks.
ITC603.5	Analyze various Wireless Network Security Standards.
ITC603.6	Review the design considerations for deploying the Wireless Network Infrastructure.

Subject Name : AI and DS – 1
Course Code : ITC604

Course	Course/Lab Outcomes

	After the completion of the course the student should be able to
ITC604.1	Develop a basic understanding of the building blocks of AI as presented in terms of intelligent agents.
ITC604.2	Apply an appropriate problem-solving method and knowledge-representation scheme.
ITC604.3	Develop an ability to analyze and formalize the problem (as a state space, graph, etc.). They will be able to evaluate and select
ITC604.4	Apply problem solving concepts with data science and will be able to tackle them from a statistical perspective.
ITC604.5	Choose and apply appropriately from a wider range of exploratory and inferential methods for analyzing data and will be able
ITC604.6	Understand and apply types of machine learning methods for real world problems.

Subject Name : Department Optional Course – 2: Green IT

Course Code :ITDO6013

Course	Course/Lab Outcomes
	After the completion of the course the student should be able to
ITDO601	Describe awareness among stakeholders and promote green agenda and green initiatives in their working environments leading
ITDO601	Identify IT Infrastructure Management and Green Data Centre Metrics for software development
ITDO601	Recognize Objectives of Green Network Protocols for Data communication.
ITDO601	Use Green IT Strategies and metrics for ICT development.
ITDO601	Illustrate various green IT services and its roles.
ITDO601	Use new career opportunities available in IT profession, audits and others with special skills such as energy efficiency, ethical

Subject Name : Web Lab

Course Code : ITL602

Course	Course/Lab Outcomes
	After the completion of the course the student should be able to
ITL602.1	Understand open source tools for web analytics and semantic web apps development and deployment
ITL602.2	Understand the basic concepts of TypeScript for designing web applications.
ITL602.3	Implement Single Page Applications using AngularJS Framework.
ITL602.4	Develop Rich Internet Applications using AJAX.
ITL602.5	Create REST Web services using MongoDB.
ITL602.6	Design web applications using Flask.

Subject Name : Sensor Lab

Course Code : ITL603

Course	Course/Lab Outcomes
	After the completion of the course the student should be able to
ITL603.1	Differentiate between various wireless communication technologies based on the range of communication, cost, propagation
ITL603.2	Conduct a literature survey of sensors used in real world wireless applications.
ITL603.3	Demonstrate the simulation of WSN using the Network Simulators (Contiki/ Tinker CAD/ Cup carbon etc).
ITL603.4	Demonstrate and build the project successfully by hardware/sensor requirements, coding, emulating and testing
ITL603.5	Report and present the findings of the study conducted in the preferred domain.
ITL603.6	Demonstrate the ability to work in teams and manage the conduct of the research study.

Subject Name : MAD & PWA Lab	
Course Code :ITL604	
Course	Course/Lab Outcomes
	After the completion of the course the student should be able to
ITL604.1	Understand cross platform mobile application development using Flutter framework
ITL604.2	Design and Develop interactive Flutter App by using widgets, layouts, gestures and animation
ITL604.3	Analyze and Build production ready Flutter App by incorporating backend services and deploying on Android / iOS
ITL604.4	Understand various PWA frameworks and their requirements
ITL604.5	Design and Develop a responsive User Interface by applying PWA Design techniques
ITL604.6	Develop and Analyse PWA Features and deploy it over app hosting solutions

Subject Name : DS using Python Lab	
Course Code : ITL605	
Course	Course/Lab Outcomes
	After the completion of the course the student should be able to
ITL605.1	Understand the concept of Data science process and associated terminologies to solve real-world problems
ITL605.2	Analyze the data using different statistical techniques and visualize the outcome using different types of plots.
ITL605.3	Analyze and apply the supervised machine learning techniques like Classification, Regression or Support Vector Machine on
ITL605.4	Apply the different unsupervised machine learning algorithms like Clustering, Decision Trees, Random Forests or Association
ITL605.5	Design and Build an application that performs exploratory data analysis using Apache Spark
ITL605.6	Design and develop a data science application that can have data acquisition, processing, visualization and statistical analysis

Subject Name : Mini Project – 2 B Based on

Course Code : ITL606	
Course	**Course/Lab Outcomes**
	After the completion of the course the student should be able to
ITL606.1	Identify the problems based on societal/research needs
ITL606.2	Apply Knowledge and skill to solve societal problems in a group and draw
ITL606.3	Draw the proper inferences from available results through theoretical/ experimental/simulations.
ITL606.4	Excel in written and oral communication.
ITL606.5	Demonstrate capabilities of self-learning in a group, which leads to life long learning
ITL606.6	Demonstrate project management principles during project work

FINAL YEAR- VII SEM	
Subject Name : AIDS II	
Course Code :	
Course	**Course/Lab Outcomes**
	After the completion of the course the student should be able to
ITC701.1	Design models for reasoning with uncertainty as well as the use of unreliable information.
ITC701.2	Analyze the process of building a Cognitive application.
ITC701.3	Design fuzzy controller system.
ITC701.4	Apply learning concepts to develop real life applications.
ITC701.5	Evaluate performance of learning algorithms.
ITC701.6	Analyze current trends in Data Science.

Subject Name : Internet of Everything Lab	
Course Code : ITC702	
Course	**Course/Lab Outcomes**
	After the completion of the course the student should be able to
ITC702.1	Identify the requirements for the real world problems
ITC702.2	Conduct a survey of several available literatures in the preferred field of study
ITC702.3	Study and enhance software/ hardware skills.
ITC702.4	Demonstrate and build the project successfully by hardware/sensor requirements, coding, emulating and testing.
ITC702.5	To report and present the findings of the study conducted in the preferred domain
ITC702.6	Demonstrate an ability to work in teams and manage the conduct of the research study.

Subject Name : STQA	
Course Code : ITDO7014	
Course	**Course/Lab Outcomes**
After the completion of the course the student should be able to	
ITDO701	Investigate the reason for bugs and analyze the principles in software testing to prevent and remove bugs.
ITDO701	Understand various software testing methods and strategies.
ITDO701	Manage the testing process and testing metrics.
ITDO701	Understand fundamental concepts of software automation and use automation tools.
ITDO701	Apply the software testing techniques in the real time environment.
ITDO701	Use practical knowledge of a variety of ways to test software and quality attributes.

Subject Name : AR-VR	
Course Code :ITDO7022	
Course	**Course/Lab Outcomes**
After the completion of the course the student should be able to	
ITDO702	Identify and compare different Augmented Reality and Mixed Reality Technologies. L1, L2
ITDO702	Apply concepts of Computer Vision for tracking in AR and MR Systems.
ITDO702	Model different interfaces and authoring in AR/MR.
ITDO702	Solve Computer Graphics Problems.
ITDO702	Analyze application of VR hardware and software components.
ITDO702	Identify issues related to visual physiology.

Subject Name : PLM	
Course Code : 405A	
Course	**Course/Lab Outcomes**
After the completion of the course the student should be able to	
C405A.1	Gain knowledge about phases of PLM, PLM strategies and methodology for PLM feasibility study and PDM implementation.
C405A.2	Illustrate various approaches and techniques for designing and developing products.
C405A.3	Apply product engineering guidelines / thumb rules in designing products for moulding, machining, sheet metal working etc.
C405A.4	Acquire knowledge in applying virtual product development tools for components, machining and manufacturing plant

	Subject Name : CSl
	Course Code : 405B

Course	Course/Lab Outcomes
	After the completion of the course the student should be able to
C405B.1	Understand the concept of cybercrime and its effect on outside world
C405B.2	Interpret and apply IT law in various legal issues
C405B.3	Distinguish different aspects of cyber law
C405B.4	Apply Information Security Standards compliance during software design and development

	Subject Name : MIS
	Course Code : 405C

Course	Course/Lab Outcomes
	After the completion of the course the student should be able to
C405C.1	Explain how information systems Transform Business
C405C.2	Identify the impact information systems have on an organization
C405C.3	Describe IT infrastructure and its components and its current trends
C405C.4	Understand the principal tools and technologies for accessing information from databases to improve business performance and
C405C.5	Identify the types of systems used for enterprise-wide knowledge management and how they provide value for businesses

	Subject Name : Data science Lab
	Course Code : C406

Course	Course/Lab Outcomes
	After the completion of the course the student should be able to
C406.1	Implement reasoning with uncertainty.
C406.2	Explore use cases of Cognitive Computing
C406.3	Implement a fuzzy controller system.
C406.4	Develop real life applications using learning concepts.
C406.5	Evaluate performance of applications.
C406.6	Implement and analyze applications based on current trends in Data Science.

	Subject Name : IOE Lab
	Course Code : C407

Course	Course/Lab Outcomes
	After the completion of the course the student should be able to
C407.1	Identify the requirements for the real world problems.
C407.2	Conduct a survey of several available literatures in the preferred field of study.
C407.3	Study and enhance software/ hardware skills.
C407.4	Demonstrate and build the project successfully by hardware/sensor requirements, coding, emulating and testing.
C407.5	To report and present the findings of the study conducted in the preferred domain.
C407.6	Demonstrate an ability to work in teams and manage the conduct of the research study.

Subject Name : SAD Lab	
Course Code : C408	

Course	Course/Lab Outcomes
	After the completion of the course the student should be able to
C408.1	Apply secure programming of application code.
C408.2	Understand the Owasp methodologies and standards.
C408.3	Identify main vulnerabilities inherent in applications.
C408.4	Apply Data Validation and Authentication for application
C408.5	Apply Security at Session Layer Management
C408.6	Apply secure coding for cryptography.

Subject Name : ROSP Lab	
Course Code : C409	

Course	Course/Lab Outcomes
	After the completion of the course the student should be able to
C409.1	Understand and apply the basic concepts of Open Source Software.
C409.2	Identify the difference between the GPL(General Public Licence) and Contribute to Open Source.
C409.3	Apply and evaluate your knowledge for the Contribute to Open Source in different Operating System.
C409.4	Apply and evaluate your knowledge for the Contribute to Open Source in different Technologies.
C409.5	Apply and evaluate your knowledge for the Contribute to Open Source in different Network Management..
C409.6	Apply and evaluate your knowledge for the Contribute to Open Source in different Applications and Services.

Subject Name : MAJOR PROJECT I	
Course Code : C410	
Course	**Course/Lab Outcomes**
	After the completion of the course the student should be able to
C410.1	Discover potential research areas in the field of IT
C410.2	Conduct a survey of several available literature in the preferred field of study
C410.3	Compare and contrast the several existing solutions, Finalize the algorithm for research challenge
C410.4	Formulate and propose design and Technological gap finding for the research plan identified
C410.5	Demonstrate an ability to work in teams and manage the conduct of the research study.
C410.6	To report and present the findings of the study conducted in the preferred domain

FINAL YEAR- VIII SEM
Subject Name : Blockchain and DLT
Course Code :ITC801

Course	**Course/Lab Outcomes**
	After the completion of the course the student should be able to
ITC801.1	Describe the basic concept of Blockchain and Distributed Ledger Technology.
ITC801.2	Interpret the knowledge of the Bitcoin network, nodes, keys, wallets and transactions
ITC801.3	Implement smart contracts in Ethereum using different development frameworks.
ITC801.4	Develop applications in permissioned Hyperledger Fabric network.
ITC801.5	Interpret different Crypto assets and Crypto currencies
ITC801.6	Analyze the use of Blockchain with AI, IoT and Cyber Security using case studies.

Subject Name : BDA	
Course Code :ITDO8011	
Course	**Course/Lab Outcomes**
	After the completion of the course the student should be able to
ITDO8011.	Explain the motivation for big data systems and identify the main sources of Big Data in the real world.
ITDO8011.	Demonstrate an ability to use frameworks like Hadoop, NOSQL to efficiently store, retrieve and process Big Data for

Course	Course/Lab Outcomes
ITDO8011.	Implement several Data Intensive tasks using the Map Reduce Paradigm.
ITDO8011.	Apply several newer algorithms for Clustering Classifying and finding associations in Big Data.
ITDO8011.	Design algorithms to analyze Big data like streams, Web Graphs and Social Media data.
ITDO8011.	Design and implement successful Recommendation engines for enterprises.

Department Name : Information Technology	
Subject Name : UID	
Course Code : ITDO8021	

Course	Course/Lab Outcomes
	After the completion of the course the student should be able to
ITDO8021.	Identify and criticize bad features of interface designs.
ITDO8021.	Predict good features of interface designs.
ITDO8021.	Illustrate and analyze user needs and formulate user design specifications.
ITDO8021.	Interpret and evaluate the data collected during the process.
ITDO8021.	Evaluate designs based on theoretical frameworks and methodological approaches.
ITDO8021.	Apply better techniques to improve the user interaction design interfaces.

Subject Name : PM	
Course Code : ILO8011	

Course	Course/Lab Outcomes
	After the completion of the course the student should be able to
ILO8011.1	Apply selection criteria and select an appropriate project from different options.
ILO8011.2	Write work break down structure for a project and develop a schedule based on it.
ILO8011.3	Identify opportunities and threats to the project and decide an approach to deal with them strategically.
ILO8011.4	Use Earned value technique and determine & predict status of the project.
ILO8011.5	Capture lessons learned during project phases and document them for future reference

Subject Name : EVS	
Course Code : ILO8019	

Course	Course/Lab Outcomes
	After the completion of the course the student should be able to
ILO8019.1	Understand the concept of environmental management
ILO8019.2	Understand ecosystem and interdependence, food chain etc.

ILO8019.3	Understand and interpret environment related legislations

Subject Name : Blockchain Lab	
Course Code : ITL801	
Course	**Course/Lab Outcomes**
	After the completion of the course the student should be able to
ITL801.1	Develop and test smart contract on local Blockchain.
ITL801.2	Develop and test smart contract on Ethereum test networks.
ITL801.3	Write and deploy smart contract using Remix IDE and Metamask.
ITL801.4	Design and develop Cryptocurrency.
ITL801.5	Write and deploy chain code in Hyperledger Fabric.
ITL801.6	Develop and test a Full-fledged DApp using Ethereum/Hyperledger.

Subject Name : CC Lab	
Course Code :ITL802	
Course	**Course/Lab Outcomes**
	After the completion of the course the student should be able to
ITL802.1	Implement different types of virtualization techniques.
ITL802.2	Analyze various cloud computing service models and implement them to solve the given problems.
ITL802.3	Design and develop real world web applications and deploy them on commercial cloud(s).
ITL802.4	Explain major security issues in the cloud and mechanisms to address them. L1,L2,L3
ITL802.5	Explore various commercially available cloud services and recommend the appropriate
ITL802.6	Implement the concept of containerization.

Subject Name : MAJOR PROJECT II	
Course Code : ITP801	
Course	**Course/Lab Outcomes**
	After the completion of the course the student should be able to
ITP801.1	Implement different types of virtualization techniques.
ITP801.2	Analyze various cloud computing service models and implement them to solve the given problems.
ITP801.3	Design and develop real world web applications and deploy them on commercial cloud(s).
ITP801.4	Explain major security issues in the cloud and mechanisms to address them. L1,L2,L3
ITP801.5	Explore various commercially available cloud services and recommend the appropriate
ITP801.6	Implement the concept of containerization.

Course outcomes A. Y. 2023-24
Department-MMS

	Subject Name :Organizational Behaviour
CO1	Apply concepts of Organizational Behaviour in organizations
CO2	Apply motivational theories according to personality types and group dynamics to influence perception
CO3	Demonstrate leadership styles according to employee personality, group dynamics and organizational structure
CO4	Analyze role of perception in group behaviour during the process of organizational development
CO5	Distinguish between employees' personalities and defense mechanisms
	Subject Name : creativity and innovation
CO1	Compare the relationship between creativity, invention and innovation.
CO2	Apply the concept of innovation & Creativity in Indian business enviroment
CO3	Illustrate the role of managers in building new ventures and start ups through crativity & Innovation
CO4	Analyze the Case Studies related to impacts of Management Strategies in crativity & Innovation
	Subject Name : Effective Team and Management Communication
CO1	Evaluate components and models of communication associated with development of business communication.
CO2	Compare Formal and Informal communication and its extraneous factors.
CO3	Evaluate approaches and consequences of grapevine in behavioural management.
CO4	Analyse the concepts and examples related to meetings and report writing.
CO5	Illustrate the role of managers when dealing with people from nationalities.
	Subject Name : Perspective Management
CO1	Evaluate organizational theories and behaviours associated with decision making.
CO2	Compare Leadership Functions and Leadership Behaviour pattern.
CO3	Evaluate approaches and consequences of crisis management.
CO4	Analyze the concepts and examples related to strategic management.
CO5	Illustrate the role of managers in building a network of relationships.

Subject Name : Business Statistics	
CO1	Apply the concept of Business Statistics in solving business problems
CO2	Apply Probability Theorem for decision making and distribution
CO3	Illustrate the knowledge of Classical Newspaper boys' problem for comparison of conditional expectations.
CO4	Analyse hypothesis testing results by using T-Test, Chi square test and Z test
CO5	Compare the methods of correlation and regression analysis for model building
Subject Name : Operation Management	
CO1	Apply the basic principles of operations management for applications in product and service industry.
CO2	Compare the Methods of EOQ, ABC and discount policy for stock and cost implications
CO3	Select QC and SQC technique to identify process improvement due to sources of variation
CO4	Describe the facility layout for equipment, machines and workflow placements.
CO5	Illustrate the knowledge of sequencing techniques in studying optimal ordering of jobs.
Subject Name : Financial Accountin	
CO1	Apply the concepts of income statements to prepare balance sheet.
CO2	Understand the concepts of inventory valuation and their effect on profit and cost of goods.
CO3	Apply the oncept of accounting mechanics&Process leadiding to preparation of Trial Balance & Financial System.
CO4	Understand the concept of Cost Accounting
Subject Name : Managerial Economics	
CO1	Illustrate the knowledge of types of demand and its factor affecting linear demand curve.
CO2	Compare the pricing practices affecting pricing decisions.
CO3	Describe the concept of supply, factors affecting supply and the law of supply for supply demand analysis.
CO4	Illustrate the production function through isoquant and isocost analysis to get a holistic production economy.
COs for SEM II	
Subject Name : HRM	

CO1	Apply Human Resource Concepts in an organization with respect to organizing personnel functions and manpower
CO2	Implement training modules on the basis of performance appraisal and organization development strategies
CO3	Apply concepts of change management to aid in organization development and human resource development strategies
CO4	Analyze motivation theories to improve employee performace and retention
CO5	Analyze Training Need during organization development

Subject Name : Effective Leadership & Team Development	
CO1	Select the right type of team and leadership style appropriate for the situation
CO2	Organize teams and colleagues more effectively
CO3	Use influencing and negotiating tactics as a leader in a Team
CO4	Apply stress and time management techniques in developing teams as a Leader
CO5	Apply Team building and Leadership concepts in Team Management

Subject Name : Indian Ethos	
CO1	Apply the concepts of Indian Ethos in business
CO2	Implement human and professional values in business decisions and everyday life
CO3	Apply spiritual wisdom and religious commonalities in management of self and organization
CO4	Apply relevant concepts of Leadership obtained from Historic Literature
CO5	Implement modern day practices and Constitutional Duties in an organization

Subject Name : BUSINESS Research METHODS	
CO1	Select Research types and designs on the basis of the research problem
CO2	Formulate a research hypothesis for a research problem and research proposal
CO3	Select the right questionnaire design to collect relevant data with the help of appropriate measurement and scaling
CO4	Apply data sampling and processing on the collected primary and secondary data
CO5	Test hypothesis with appropriate analysis techniques
	Apply appropriate structure and ethics in Research report writing

Subject Name : Marketing Management	
CO1	Apply Marketing Management concepts for organizational Development
CO2	Analyse Market Environment for market research and consumer buying process
CO3	Evaluate pillars of marketing for marketing mix and new product development process
CO4	Apply pricing decision strategies for distribution promotion and personal selling
CO5	Implement marketing models for effective planning strategies
Subject Name : Financial Management	
CO1	Apply the concepts of corporate finance and Indian financial system.
CO2	Describe dividend policy and its impact on dividend payout ratio and retention ratio.
CO3	Apply the concept of Financial Planing & Forecasting
CO4	Apply the concept of Capital Structure Planning & Leverage Analysis
Subject Name : Operation Research	
CO1	Illustrate the knowledge of game theory and its usage in competitive business environment.
CO2	Compare the linear programming formulation affecting data envelopment analysis.
CO3	Describe the concept of transportation problems affecting project management.
CO4	Evaluate effects of project management techniques under risk and uncertainty.
Subject Name : Entrepreneurship Management	
CO1	Evaluate Legal framework for starting a business in India
CO2	Compare Indian family business with international entrepreneurship
CO3	Analyze the concepts and examples related to entrepreneur and entrepreneurship.
CO4	Illustrate the role of managers in building new ventures and start ups.
CO5	Describe PEST factors and its application in the start up business model.
COs for SEM III	
Subject Name : International Business(Common Subject For All Specialization)	

CO1	Evaluate cross cultural management and the cultural differences
CO2	Compare EPRG Model and Country Analysis.
CO3	Evaluate appropriate approaches and consequences of culture and leader effectiveness.
CO4	Analyze the concepts and examples related to investment decisions.
CO5	Illustrate the impact of I-R model on subsidiary management.

Subject Name : Strategic Management (Common Subject)	
CO1	Illustrate the use of PESTEL and SWOT as tools for strategic formulation.
CO2	Compare the relationship between Ansoff matrix and grand strategy for strategic formulation.
CO3	Describe Porter's Generic strategies and Value chain
CO4	Illustrate SBU and McKinsey models for strategic coherence.
CO5	Demonstrate the Red-Blue-Purple Ocean strategy

Specilization : HR	

Subject Name : Compensation & Benefits	
CO1	Apply concepts of reward strategies in an organization
CO2	Analyze components of a compensation of an employee in an organization
CO3	Design an effective compensation structure of an employee based on reward strategies and inflation
CO4	Analyze data collected from market research and remuneration survey for a salary proposal
CO5	Identify intrinsic and extrinsic benefits to be given to employees as part of compensation
CO6	Apply tax laws in the compensation structures of employees in an organization

Subject Name : Competency Based HRM and Performance Management	
CO1	Compare the application of performance appraisal systems in terms of employee development
CO2	Evaluate the role of appraiser in conducting staff appraisal
CO3	Analyze the concepts of validating competency models
CO4	Analyze the role of Human Resource Management in building ethical performance management practices

CO5	Analyze cases of multinational corporations' pitfalls and limitation
Subject Name : Global HRM	
CO1	Apply concepts of Human Resource Management in Domestic and International Workforce
CO2	Analyze International Human Resource Practices for Effective International Workforce Management
CO3	Implement emerging employee relation trends in the organization
CO4	Analyze the legal framework involved in International Human Resource Management
CO5	Apply International Recruiting and Training methods while managing International Workforce Management
Subject Name : Human Resource Planning and Application of Technology in HR	
CO1	Compare the concepts of Selection and job analysis for a profile for the recruitment process
CO2	Identify appropriate methods for job analysis for effective hiring
CO3	Organize diversity in a work force for effective implementation of strategies
CO4	Illustrate the knowledge of technology in human resource management, in relation to recruitment, payroll and forecasting
Subject Name : Training & Development	
CO1	Evaluate the concepts of training, structure, need assessment and training evaluation.
CO2	Compare major learning methodologies and principles of Adult Learning.
CO3	Evaluate training budget, calendar and training modules.
CO4	Analyze the concepts and examples related to satellite Based Training, Outbound Training and fusion methodology.
CO5	Illustrate the role of managers in methods of planning, organizing conferences and training audit.
CO6	Analyze the Case Studies related to competency modeling and mapping.
Subject Name : Labour Law	
CO1	Apply system approach to IR and IR Model relating to labour laws for industrial purpose
CO2	Apply Industrial Dispute Act and Trade Union Act for amendments and provisions for industrial functioning
CO3	Apply Social Security Legislations and Wage Legislations for fair wage practices
CO4	Evaluate theory of Maternity Benefit Act and Apprentice Act for employee benefit

CO5	Apply Factories Act and Bombay Shop and Establishment Act for welfare of workers and shop owners..

Specilization : Finance

Subject Name : **Financial Markets and Institutions**	
CO1	Apply the concepts of spot rates and forward rates to measure risk of fixed income securities.
CO2	Critically evaluate the historical development of regulations and supervision of financial markets for both bank based and market based systems
CO3	To understand different components of the Indian Financial system and their functions.
CO4	Apply different company valuation techniques to determine share prices
CO5	Students will have critical thinking and problem solving skills applicable to business and management practice or issues

Subject Name : **Corporate Valuation and Mergers & Acquisitions**	
CO1	Illustrate the process of valuation for judical & Regulatory people
CO2	Compare financial statement from valuation perspective
CO3	Examine discounted approach to valuation & Evaluate noc DCF valuation model for business restructuring strartegies in a company
CO4	Applying pricing application in valuation

Subject Name : **Security Analysis and Portfolio Management**	
CO1	Analyize types of securities for risk calculation
CO2	Apply efficiense market hypothesies for price calculation & Equity research
CO3	Apply indexing & Benchmarking for tracking in index
CO4	Analyzing capital asset prising model & Portfolio risk management
CO5	Apply Factor model & Arbitrage pricing theory for valuation

Subject Name : **Financial Regulations**	
CO1	Analyizing Need & Significance Of Iondian financial system & Regulation
CO2	Analyzing the framework of various financial regulatory & Satutory bodies like Sebi &RBI
CO3	Applying IRDA &CCI Regulatory frameworkin Financial System
CO4	Evaluate FEMA For account Transaction & Evaluate money laundering concept

CO5	Analyze Regulatory framework in Commodity market
Subject Name : Derivatives and Risk Management	
CO1	Evaluate components of Bull call spread, Bear put spread, Ladder and Ladder ratio spreads.
CO2	Compare trading option for trading risk free arbitrage
CO3	Analyze the concepts and examples related to Risk Management using Greeks Delta, Theta, Vega and Gamma risks of options.
CO4	Illustrate risk managemnt stratergies for option volatity
CO5	Apply the concept of derevative market for financial risk management
Subject Name : Banking and Financial Services Institutions	
CO1	Evaluate the concepts of Fund based and Fee based services.
CO2	Compare major banking products and services available for retail and corporate banks in India.
CO3	Evaluate Mutual Funds Products, schemes and investment plans.
CO4	Analyze the concepts and examples related to leasing, leasing procedure followed by Indian Financial Institutions
CO5	Illustrate the role of managers in building direct marketing communication tools.
Subject Name : Mutual Funds	
CO1	Applying concepts of investing in mutual fund industry
CO2	Analyzing types of funds as per regulatory framework
CO3	Applying Net Asset value for financial planning
CO4	Comparing investment products for portfolio management
CO5	Assuring protection of investors through customer grievance redressal process, RTI act
Specilization : Marketing	
Subject Name : Digital Marketing	
CO1	Apply concepts of marketing on a digital platform
CO2	Analyze consumer behavior on the basis of analytical reports generated in Search Engine Optimization and AdWords Campaign
CO3	Design Social Media and Search Engine Marketing campaign strategies to improve company digital visibility

CO4	Apply relevant pricing models based on campaign analytics
CO5	Apply knowledge of social media, email and mobile marketing in e-Commerce

Subject Name : Consumer Behaviour	
CO1	Apply the concept and models of consumer behavior for marketing strategy
CO2	Evaluate motivational theories to encourage consumer decision making process
CO3	Analyze consumer psychology and attitude towards marketing strategies
CO4	Evaluate purchase and group behavior based on social class in current digital evolution
CO5	Analyze organizational buying process with respect to emerging cultural trends in Indian Market

Subject Name : Services Marketing	
CO1	Apply the concepts of services marketing for customer satisfaction and retention
CO2	Compare the demand sensitive services for developing quantitative ability for decision making.
CO3	Apply the concept of Complaint handling, Service Failure & Service Recovery.
CO4	Illustrate SERVQUAL model in various business scenarios.
CO5	Classify the types of Consumer Behaviour in Services and the reciprocating strategies.

Subject Name : Sales Management	
CO1	Apply Sales Management concept in any business organization
CO2	Apply selling skills; Negotiation skills for services sales against physical goods sales
CO3	Evaluate approaches and consequences of territory management and route planning.
CO4	Analyze the concepts and examples related to forecasting techniques and trend analysis.
CO5	Analyze the role of sales managers in field's sales control and sales management.

Subject Name : Marketing Strategy	
CO1	Apply Marketing Strategy concept for new product development
CO2	Apply Market intelligence for market research and investment
CO3	Evaluate product and brand policy aligning with organization culture

CO4	Apply pricing strategies for product promotion
CO5	Evaluate Market Plan for channel selection strategy

Subject Name : Product and Brand Management	
CO1	Evaluate Product Mix and Strategic Business Unit Strategies in multifactor mix
CO2	Evaluate Branded House Vs House of Brands and Corporate Brand
CO3	Evaluate approaches and consequences of Brand prism by Kapferer Model in Brand Anatomy
CO4	Analyse the concepts and examples of Brand Equity.
CO5	Illustrate the role of managers in building Product and brand concepts.

Specilization : SYSTEM/IT	
Subject Name : Database Management System & Data Warehousing	
CO1	Evaluate components and models of entity relationship and entity sets.
CO2	Compare Database Management System at Logical, Conceptual and physical system environment.
CO3	Evaluate Data warehousing, Multidimensional Data models and data warehousing architecture.
CO4	Analyze the concepts of Data Fragmentation, Replication and Allocation Techniques for distributed data base design
CO5	Illustrate Simple Centralized Database System and its advantages to users.
CO6	Analyze the Cases related to Traditional file System and Modern Data base management system.

Subject Name : Enterprise Management Systems	
CO1	Evaluate Merits and Demerits Enterprise Resource Planning.
CO2	Compare application Areas of ERP in SCM and CRM.
CO3	Evaluate industry verticals and impact of ERP on the verticals.
CO4	Analyze the concepts and examples related to enterprise content management.
CO5	Illustrate the role of IT and Systems building cashless and process oriented organizations.

Subject Name : Big Data and Business Analytics	
CO1	Apply the concepts of ELT Data processing chain from business intelligence to business analytics.

CO2	Analyzing Data Mining and decision making predictive analysis forecasting.
CO3	Evaluate theory of NLP, Regression, Correlation and cluster analysis for data driven prediction.
CO4	Analyze informative Cognos and integration social analytics for business application.
Subject Name : Knowledge Management	
CO1	Illustrate the knowledge and expertise meaning of epistemology.
CO2	Compare Procedural Vs Declarative, Tactic Vs Explicit generals.
CO3	Analyzing concept of environment forces driving KM organizational issues in KM Systems.
CO4	Illustrate factors influencing universalistic and contingency view leadership.
CO5	Classify Infrastructure, Mechanisms, technologies of KM Solutions and components.
Subject Name : Software Engineering	
CO1	Compare the phases of software development life cycle model.
CO2	Analyze use of structured methods for visualization of the IT based solution.
CO3	Analalyize software estimation and methods of software estimation.
CO4	Illustrate the knowledge of documenting software development process for user requirement specifications.
CO5	Apply functional testing, automated methods for testing and stress test for quality assurance in each phase.
Subject Name : Data Mining and Business Intelligence	
CO1	Evaluate Architecture of Data Mining and its functionalities.
CO2	Compare data mining techniques and its statistical perspective.
CO3	Evaluate role of business intelligence in modern business and its challenges.
CO4	Analyze the Enterprise Performance Life Cycle framework elements implemented in BI.
CO5	Analyze the Case Studies related to industry approaches and trends towards data mining.
Specilization : Operation	
Subject Name : Manufacturing Resource Planning and Control	
CO1	Compare the MRP1 and MRPII benefits use in decision making

CO2	Analyze criteria for good capacity requirement planning and scheduling strategies
CO3	Apply MRPC models optimization for capacity planning models lay out
CO4	Illustrate the knowledge of broader heading ,safety and hedges on MPS module
CO5	Analyze independent and dependent demand for quantitative problems

Subject Name : Material Management	
CO1	Apply the material management concepts for material planning and purchase
CO2	Analyze criteria for Supplier Quality Assurance programme for International procurement-Imports
CO3	Identify Types of inventories of stores and benefits of scientific storekeeping models for capacity planning
CO4	Illustrate the knowledge of codification for standardization
CO5	Analyze Obsolete, Surplus and Scrap management for stock verification and material handling ethically"

Subject Name : Operation Analytics	
CO1	Apply the concepts of MAD, MSE, MAPE & tracking signal.
CO2	Analyze risk and performance indices with respect to cost, capacity, quality logistics and distribution.
CO3	Apply supply chain analytics and its impact on Procurement, Manufacturing.
CO4	Evaluate reporting, drill down, utility view and process view.
CO5	Analyze performance metrics for inventory decision for dashboard design and scorecard design

Subject Name : Service Operation Management	
CO1	Compare the benefits of service operation management for service delivery and site selection
CO2	Analyze demand sensitive services for Integer Programming and Location Selection
CO3	Identify profitability in service industry through yield management technique
CO4	Illustrate inventory management techniques for outsourcing and offshoring
CO5	Analyze Performance measurement of Service Operations for cost and productivity measures

Subject Name : Supply Chain Management	
CO1	Compare the benefits of resource planning procedures for decision making.

CO2	Analyze criteria for capacity requirement planning and scheduling strategies.
CO3	Identify models optimization for capacity planning models lay out.
CO4	Illustrate the knowledge of Broader heading, safety and hedges on MPS module.
CO5	Analyze independent & dependent demand for quantitative problems.
Subject Name : Industrial Engineering Applications & Management	
CO1	Evaluate industrial engineering scope and productivity.
CO2	Compare ILO framework for industrial engineering standards
CO3	Evaluate different approaches and consequences of work study measurement.
CO4	Analyze the concepts and examples related to white collar productivity.
CO5	Illustrate the role of managers in building P,Q,R,S,T concepts.
COs for SEM IV	
Specilization : HR	
Subject Name : OD and Change Management	
CO1	Apply the concepts of Creativity and Innovation in organizational change and development
CO2	Analyze performance management and organizational culture during organizational diagnosis
CO3	Apply theories and Techniques of intervention during organizational development
CO4	Implement appropriate steps to monitor change and reduce resistance during change in organization
CO5	Analyze Latest Trends of the market to incorporate in the organizational culture and its internal environment
Specilization : Finance	
Subject Name : Commercial Banking	
CO1	Applying the concept of commercial banking & dangers of money laundering
CO2	Illustrate the knowledg of term loan and working capital , tresury operation and how to appraise a credit proposal.
CO3	Illustrate the knowledge of Legal Aspects of Banking, Negotiable Instrument Act, Retail banking and Banking Regulation Act.
CO4	Demonstrate the India's agrarian sector and regional rural banks priority sector .

	Specilization : Marketing
	Subject Name : Trends in Marketing
CO1	Analyze trends in marketing while keeping development goals in mind
CO2	Apply appropriate strategies when marketing for targeted income level
CO3	Use recent market trends in Pricing, Promotion, Positioning, Data Analysis and Communication
CO4	Analyze global marketing trends in marketing of recent trending products
CO5	Design marketing strategies using data of customer experience and expectation
CO6	Develop strategies with Marketing 4.0 and appropriate intelligence and counter intelligence measures
	Specilization : SYSTEM/IT
	Subject Name : Strategic Information Technology Management
CO1	Apply the concepts related to value chain, five forces, Information asymmetry and Technology.
CO2	Apply Strategic Role of IT in gaining Competitive advantage.
CO3	Analyze different methods of Web related technologies, web media to use world wide web for business.
CO4	Illustrate the knowledge of Mobile technology and impact on business and mobile strategy
CO5	Apply the concepts of Writing own strategy- Develop.
	Specilization : Operation
	Subject Name : Operations Outsourcing and Off shoring
CO1	Understand the basic principles of risks pertaining to Outsourcing & mitigation of risks .
CO2	Compare Offshoring Cost Issues and Offshoring Non Cost Issues .
CO3	Apply Factors driving Outsourcing and Scale of production or service.
CO4	Anallyze the Unethical and Ethical issues facing the Offshoring.
CO5	Illustrate the knowledge of trade dispute and international disputes in offshoring.
	Subject Name : Project Management (UA) (Common Subject)
CO1	Evaluate Project Management Concepts and attributes of Project lifecycle and stake holders

CO2	Compare Average and Exponential smoothing methods with Techno-economic feasibility
CO3	Evaluate Time and cost estimates with AON and AOA Conventions for Budget estimates .
CO4	Analyze the concepts and examples related to project management.
CO5	Illustrate the concept of Project scheduling and Risk Management techniques.