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2.6.1 Teachers and students are aware of the stated Programme and course outcomes of the Programmes offered by the institution.

Department of Computer Engineering

Subject Name :Engineering Mathematics III	
Subject Code : CSC301	
Course Code :CSC301	
Course Code	**Course Outcomes**
After the completion of the course the student should be able to	
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.
Subject Name :Discrete Structures and Graph Theory	
Subject Code : CSC302	
Course Code :CSC302	
Course Code	**Course Outcomes**
After the completion of the course the student should be able to	
CSC302.1	To understand the notion of mathematical thinking, mathematical proofs and their use 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
Subject Name :Data Structure	
Subject Code : CSC303	
Course Code :CSC303	
Course Code	**Course Outcomes**
After the completion of the course the student should be able to	
CSC303.1	Implement Linear and Non-Linear data structures.
CSC303.2	Handle various operations like searching, insertion, deletion and traversals on various data structures.
CSC303.3	Explain various data structures, related terminologies and its types.
CSC303.4	Choose appropriate data structure and apply it to solve problems in various domains.
CSC303.5	Analyze and Implement appropriate searching techniques for a given problem.
CSC303.6	Demonstrate the ability to analyze, design, apply and use data structures to solve engineering problems and evaluate their solutions.

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Subject Name :Digital Logic & Computer Architecture	
Subject Code : CSC304	
Course Code :CSC304	
Course Code	**Course Outcomes**
After the completion of the course the student should be able to	
CSC304.1	Learn different number system and basic structure of computer system
CSC304.2	Demonstrate the arithmetic algorithm
CSC304.3	Understand the basic concept of digital components and processor organization
CSC304.4	Understand the generation of control signal of computer
CSC304.5	Demonstrate the memory organization
CSC304.6	Describe the concept of parallel processing and different buses
Subject Name :Computer Graphics	
Subject Code : CSC305	
Course Code :CSC305	
Course Code	**Course Outcomes**
After the completion of the course the student should be able to	
CSC305.1	Understand the basic concepts of Computer Graphics.
CSC305.2	Apply various algorithms for basic graphics primitives.
CSC305.3	Apply 2-D geometric transformations on graphical objects.
CSC305.4	Use various Clipping algorithms on graphical objects

CSC305.5	Explore 3-D geometric transformations, curve representation techniques and projections methods.
CSC305.6	Explain visible surface detection techniques and Animation.
Subject Name :Data Structure Lab	
Subject Code :CSL301	
Course Code :CSL301	
After the completion of the course the student should be able to	
Course Code	**Course Outcomes**
CSL301.1	Implement linear data structures & be able to handle operations like insertion, deletion, searching and traversing on them.
CSL301.2	Implement nonlinear data structures & be able to handle operations like insertion, deletion, searching and traversing on them
CSL301.3	Choose appropriate data structure and apply it in various problems
CSL301.4	Select appropriate searching techniques for given problems.
Subject Name :Digital Logic & Computer Architecture Lab	
Subject Code :CSL302	
Course Code :CSL302	
After the completion of the course the student should be able to	
Course Code	**Course Outcomes**
CSL302.1	Understand the basic of digital components
CSL302.2	Design the basic building block of computer: ALU, registers, CPU and memory
CSL302.3	Recognize the importance of digital systems in computer architecture
CSL302.4	Implement various algorithms for arithmetic operations

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Subject Name :Computer Graphics Lab	
Subject Code :CSL303	
Course Code :CSL303	
Course Code	**Course Outcomes**
After the completion of the course the student should be able to	
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
Subject Name :Skill base Lab course: Object Oriented Programming with Java	
Subject Code :CSL304	
Course Code :CSL304	
Course Code	**Course Outcomes**
After the completion of the course the student should be able to	
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.
Subject Name :Mini Project – 1 A	
Subject Code :CSM301	
Course Code :CSM301	
Course Code	**Course Outcomes**
After the completion of the course the student should be able to	
CSM301.1	Identify problems based on societal /research needs.
CSM301.2	Apply Knowledge and 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.

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Subject Name :Engineering Mathematics-IV	
Subject Code :CSC401	
Course Code :CSC401	
Course Code	**Course Outcomes**
After the completion of the course the student should be able to	
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 contour integrals.
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.
Subject Name :Analysis of Algorithms	
Subject Code :CSC402	
Course Code :CSC402	
Course Code	**Course Outcomes**
After the completion of the course the student should be able to	
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.
Subject Name : Database Management System	
Subject Code :CSC403	
Course Code :CSC403	
Course Code	**Course Outcomes**
After the completion of the course the student should be able to	
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.
Subject Name : Operating System	
Subject Code :CSC404	
Course Code :CSC404	
Course Code	**Course Outcomes**
After the completion of the course the student should be able to	
CSC404.1	Understand role of Operating System in terms of process, memory, file and I/O management.
CSC404.2	Understand the concept of a process, thread, mutual exclusion and deadlock.

CSC404.3	Apply performance of process scheduling algorithms and IPC.
CSC404.4	Apply the concepts of memory management techniques.
CSC404.5	Analyze the performance of memory allocation and replacement techniques.
CSC404.6	Apply different techniques of file and I/O management.
Subject Name : Microprocessor	
Subject Code :CSC405	
Course Code :CSC405	
Course Code	**Course Outcomes**
After the completion of the course the student should be able to	
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 microprocessor
CSC405.6	Understand hyper threading technology
Subject Name : Analysis of Algorithms Lab	
Subject Code :CSL401	
Course Code :CSL401	
Course Code	**Course Outcomes**

After the completion of the course the student should be able to	
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.
Subject Name : Database Management System Lab	
Subject Code :CSL402	
Course Code :CSL402	
Course Code	**Course Outcomes**
After the completion of the course the student should be able to	
CSL402.1	Implement DDL & DML commands in SQL
CSL402.2	Apply the concept of normalization in DBMS
CSL402.3	Understand the concepts of constraints in SQL
CSL402.4	Apply the concepts of views and triggers in SQL
CSL402.5	Apply the concepts of triggers in SQL
CSL402.6	Implement transaction management in SQL
Subject Name : Operating System Lab	
Subject Code :CSL403	
Course Code :CSL403	
Course Code	**Course Outcomes**
After the completion of the course the student should be able to	

CSL403.1	Understand basic Operating system Commands, Shell scripts, System Calls in 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	Analyze concepts of file management and I/O management techniques.
Subject Name : Microprocessor Lab	
Subject Code :CSL404	
Course Code :CSL404	
Course Code	**Course Outcomes**
After the completion of the course the student should be able to	
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
Subject Name : Skill base Lab course: Python Programming	
Subject Code :CSL405	
Course Code :CSL405	
Course Code	**Course Outcomes**
After the completion of the course the student should be able to	
CSL405.1	Understand basic concepts in python.

CSL405.2	Explore contents of files, direcries and text processing with python
CSL405.3	Develop program for data structure using built in functions in python.
CSL405.4	Explore django web framework for developing python-based web application.
CSL405.5	Understand Multithreading concepts using python.
Subject Name : Mini Project - 1 B	
Subject Code :CSM401	
Course Code :CSM401	
Course Code	**Course Outcomes**
After the completion of the course the student should be able to	
CSM401.1	Identify problems based on societal /research needs.
CSM401.2	Apply Knowledge and 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.

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Subject Name : Microprocessor	
Subject Code :CSC501	
Course Code :CSC501	
Course Code	**Course Outcomes**
After the completion of the course the student should be able to	
CSC501.1	Describe architecture of x86 processors
CSC501.2	Interpret the instructions of 8086 and write assembly and Mixed language programs
CSC501.3	Explain the concept of interrupts
CSC501.4	Design 8086 based system using memory and peripheral chips
CSC501.5	Appraise the architecture of advanced processors
Subject Name : DataBase Management System	
Subject Code :CSC502	
Course Code :CSC502	
Course Code	**Course Outcomes**
After the completion of the course the student should be able to	
CSC502.1	Understand the fundamentals of a database systems
CSC502.2	Design and draw ER and EER diagram for the real life problem.
CSC502.3	Convert conceptual model to relational model and formulate relational algebra queries.
CSC502.4	Design and querying database using SQL.
CSC502.5	Analyze and apply concepts of normalization to relational database design.

CSC502.6	Understand the concept of transaction, concurrency and recovery.
Subject Name :Computer Networks	
Subject Code :CSC503	
Course Code :CSC503	
Course Code	**Course Outcomes**
After the completion of the course the student should be able to	
CSC503.1	Demonstrate the concepts of data communication at physical layer and compare ISO - OSI model with TCP/IP model.
CSC503.2	Demonstrate the knowledge of networking protocols at data link layer.
CSC503.3	Design the network using IP addressing and subnetting / supernetting schemes.
CSC503.4	Analyze various routing algorithms and protocols at network layer.
CSC503.5	Analyze transport layer protocols and congestion control algorithms.
CSC503.6	Explore protocols at application layer .
Subject Name :Theory of Computer Science	
Subject Code :CSC504	
Course Code :CSC504	
Course Code	**Course Outcomes**
After the completion of the course the student should be able to	
CSC504.1	Identify the central concepts in theory of computation and differentiate between deterministic and nondeterministic automata, also obtain equivalence of NFA and DFA.
CSC504.2	Infer the equivalence of languages described by finite automata and regular expressions.
CSC504.3	Devise regular, context free grammars while recognizing the strings and tokens.

CSC504.4	Design pushdown automata to recognize the language.
CSC504.5	Develop an understanding of computation through Turing Machine.
CSC504.6	Acquire fundamental understanding of decidability and undecidability
Subject Name :Multimedia System	
Subject Code :CSDLO5011	
Course Code :CSDLO5011	
Course Code	**Course Outcomes**
After the completion of the course the student should be able to	
CSDLO5011.1	Identify basics of multimedia and multimedia system architecture.
CSDLO5011.2	Understand different multimedia components.
CSDLO5011.3	Explain file formats for different multimedia components.
CSDLO5011.4	Analyze the different compression algorithms.
CSDLO5011.5	Describe various multimedia communication techniques.
CSDLO5011.6	Apply different security techniques in multimedia environment.
Subject Name :Microprocessor Lab	
Subject Code :CSL501	
Course Code :CSL501	
Course Code	**Course Outcomes**
After the completion of the course the student should be able to	
CSL501.1	Use appropriate instructions to program microprocessor to perform various task

CSL501.2	Develop the program in assembly/ mixed language for Intel 8086 processor
CSL501.3	Demonstrate the execution and debugging of assembly/ mixed language program
Subject Name :Computer Networks Lab	
Subject Code :CSL502	
Course Code :CSL502	
Course Code	**Course Outcomes**
After the completion of the course the student should be able to	
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 protocol
CSL502.3	Implement programs using core programming APIs for understanding networking concepts
Subject Name : Database & Info. System Lab	
Subject Code :CSL503	
Course Code :CSL503	
Course Code	**Course Outcomes**
After the completion of the course the student should be able to	
CSL503.1	Design and draw ER and EER diagram for the real life problem with software tool.
CSL503.2	Create and update database and tables with different DDL and DML statements.
CSL503.3	Apply /Add integrity constraints and able to provide security to data.
CSL503.4	Implement and execute Complex queries.
CSL503.5	Apply triggers and procedures for specific module/task

CSL503.6	Handle concurrent transactions and able to access data through front end (using JDBC ODBC connectivity.)
Subject Name :Web Design Lab	
Subject Code :CSL504	
Course Code: CSL504	
Course Code	**Course Outcomes**
After the completion of the course the student should be able to	
CSL504.1	Understand the core concepts and features of Web Technology
CSL504.2	Design static web pages using HTML5 and CSS3
CSL504.3	Apply the concept of client side validation and design dynamic web pages using JavaScript and JQuery.
CSL504.4	Evaluate client and server side technologies and create Interactive web pages using PHP , AJAX with database connectivity using MySQL.
CSL504.5	Understand the basics of XML, DTD and XSL and develop web pages using XML / XSLT.
CSL504.6	Analyze end user requirements and Create web application using appropriate web technologies and web development framework
Subject Name :Business Communication & Ethics	
Subject Code :CSL505	
Course Code: CSL505	
Course Code	**Course Outcomes**
After the completion of the course the student should be able to	
CSL505.1	Design a technical document using precise language, suitable vocabulary and apt style.
CSL505.2	Develop the life skills/interpersonal skills to progress professionally by building stronger relationships.
CSL505.3	Demonstrate awareness of contemporary issues knowledge of professional and ethical responsibilities.

CSL505.4	Apply the traits of a suitable candidate for a job/higher education , upon being trained in the techniques of holding a group discussion, facing interviews and writing resume/SOP.
CSL505.5	Deliver formal presentations effectively implementing the verbal and non-verbal skills
Subject Name :Software Engineering	
Subject Code :CSC601	
Course Code:CSC601	
Course Code	**Course Outcomes**
After the completion of the course the student should be able to	
CSC601.1	Understand and demonstrate basic knowledge in software engineering.
CSC601.2	Identify requirements, analyze and prepare models.
CSC601.3	Plan, schedule and track the progress of the projects.
CSC601.4	Design & develop the software projects.
CSC601.5	Identify risks, manage the change to assure quality in software projects.
CSC601.6	Apply testing principles on software project and understand the maintenance concepts.
Subject Name :System Programming and Compiler Construction	
Subject Code :CSC602	
Course Code:CSC602	
Course Code	**Course Outcomes**
After the completion of the course the student should be able to	
CSC602.1	Identify the relevance of different system programs.
CSC602.2	Describe the various data structures and passes of assembler design.

CSC602.3	Identify the need for different features and designing of macros.
CSC602.4	Distinguish different loaders and linkers and their contribution in developing efficient user applications.
CSC602.5	Construct different parsers for given context free grammars.
CSC602.6	Justify the need synthesis phase to produce object code optimized in terms of high execution speed and less memory usage
Subject Name :Data Warehousing & Mining	
Subject Code :CSC603	
Course Code:CSC603	
Course Code	**Course Outcomes**
After the completion of the course the student should be able to	
CSC603.1	Understand Data Warehouse fundamentals, Data Mining Principles
CSC603.2	Design data warehouse with dimensional modelling and apply OLAP operations.
CSC603.3	Identify appropriate data mining algorithms to solve real world problems
CSC603.4	Compare and evaluate different data mining techniques like classification, prediction, clustering and association rule mining
CSC603.5	Describe complex data types with respect to spatial and web mining.
CSC6.3.6	Benefit the user experiences towards research and innovation.
Subject Name :Cryptography and system security	
Subject Code :CSC604	
Course Code:CSC604	

Course Code	Course Outcomes
After the completion of the course the student should be able to	
CSC604.1	Understand system security goals and concepts, classical encryption techniques and acquire fundamental knowledge on the concepts of modular arithmetic and number theory.
CSC604.2	Understand, compare and apply different encryption and decryption techniques to solve problems related to confidentiality and authentication
CSC604.3	Apply the knowledge of cryptographic checksums and evaluate the performance of different message digest algorithms for verifying the integrity of varying message sizes.
CSC604.4	Apply different digital signature algorithms to achieve authentication and design secure applications
CSC604.5	Understand network security basics, analyze different attacks on networks and evaluate the performance of firewalls and security protocols like SSL, IPSec, and PGP.
CSC604.6	Analyze and apply system security concept to recognize malicious code
Subject Name :Machine Learning	
Subject Code :CSDLO6021	
Course Code:CSDLO6021	
Course Code	**Course Outcomes**
After the completion of the course the student should be able to	
CSC604.1	Gain knowledge about basic concepts of Machine Learning
CSC604.2	Illustrate machine learning techniques suitable for a given problem
CSC604.3	Solve the problems using various machine learning techniques
CSC604.4	Apply Dimensionality reduction techniques.
CSC604.5	Design application using machine learning techniques

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Subject Name :Software Engineering Lab	
Subject Code :CPL601	
Course Code:CPL601	
Course Code	**Course Outcomes**
After the completion of the course the student should be able to	
CPL601.1	Identify requirements and apply process model to selected case study.
CPL601.2	Design models for the selected case study using UML modeling.
CPL601.3	Use various software engineering tools.
Subject Name :System Software Lab	
Subject Code :CPL602	
Course Code:CPL602	
Course Code	**Course Outcomes**
After the completion of the course the student should be able to	
CSL602.1	Generate machine code by using various databases generated in pass one of two pass assembler.
CSL602.2	Construct different databases of single pass macro processor.
CSL602.3	Identify and validate different tokens for given high level language code.
CSL602.4	Parse the given input string by constructing Top down /Bottom up parser.
CSL602.5	Implement synthesis phase of compiler with code optimization techniques.
CSL602.6	Explore and use various tools like LEX and YACC.

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Subject Name :Data Warehousing & Mining Lab	
Subject Code :CPL603	
Course Code:CPL603	
Course Code	**Course Outcomes**
After the completion of the course the student should be able to	
CPL603.1	Design data warehouse and perform various OLAP operations.
CPL603.2	Implement classification, prediction, clustering and association rule mining algorithms.
CPL603.3	Demonstrate classifications, prediction, clustering and association rule mining algorithms on a given set of data sample using data mining tools.
CPL603.4	Implement spatial and web mining algorithms.
Subject Name :System Security Lab	
Subject Code :CPL604	
Course Code:CPL604	
Course Code	**Course Outcomes**
After the completion of the course the student should be able to	
CPL604.1	Apply the knowledge of symmetric cryptography to implement simple ciphers.
CPL604.2	Analyze and implement public key algorithms like RSA and El Gamal.
CPL604.3	Analyze and evaluate performance of hashing algorithms.
CPL604.4	Explore the different network reconnaissance tools to gather information about networks.
CPL604.5	Explore and use tools like sniffers, port scanners and other related tools for analyzing packets in a network.
CPL604.6	Apply firewalls and intrusion detection systems using open source technologies and to explore email security.

CPL604.7	Implement various attacks like buffer-overflow, and web-application attacks.
Subject Name :Mini Project	
Subject Code :CSP605	
Course Code:CSP605	
Course Code	**Course Outcomes**
After the completion of the course the student should be able to	
CSP605.1	Acquire practical knowledge within the chosen area of technology for project development.
CSP605.2	Identify, analyze, formulate and handle programming projects with a comprehensive and systematic approach
CSP605.3	Contribute as an individual or in a team in development of technical projects
CSP605.4	Develop effective communication skills for presentation of project related activities
Subject Name :Digital Signal and Image Processing	
Subject Code :CSC701	
Course Code:CSC701	
Course Code	**Course Outcomes**
After the completion of the course the student should be able to	
CSC701.1	Apply the concept of DT Signal and DT Systems.
CSC701.2	Classify and analyze discrete time signals and systems
CSC701.3	Implement Digital Signal Transform techniques DFT and FFT.
CSC701.4	Use the enhancement techniques for digital Image Processing
CSC701.5	Differentiate between the advantages and disadvantages of different edge detection techniques

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Subject Name :Mobile Communication & Computing	
Subject Code :CSC702	
Course Code:CSC702	
Course Code	**Course Outcomes**
After the completion of the course the student should be able to	
CSC702.1	Identify basic concepts and principles in mobile communication & computing, cellular architecture.
CSC702.2	Describe the components and functioning of mobile networking.
CSC702.3	Classify variety of security techniques in mobile network.
CSC702.4	Apply the concepts of wlan for local as well as remote applications.
CSC702.5	Describe and apply the concepts of mobility management
CSC702.6	Describe long term evolution (lte) architecture and its interfaces
Subject Name :Artificial Intelligence & Soft Computing	
Subject Code :CSC703	
Course Code:CSC703	
Course Code	**Course Outcomes**
After the completion of the course the student should be able to	
CSC703.1	Identify the various characteristics of Artificial Intelligence and Soft Computing techniques.
CSC703.2	Choose an appropriate problem solving method for an agent to find a sequence of actions to reach the goal state.
CSC703.3	Analyze the strength and weakness of AI approaches to knowledge representation, reasoning and planning.
CSC703.4	Construct supervised and unsupervised ANN for real world applications.

CSC703.5	Design fuzzy controller system.
CSC703.6	Apply Hybrid approach for expert system design.
Subject Name :Cyber Security and Laws	
Subject Code :ILO 7016	
Course Code: ILO 7016	
Course Code	**Course Outcomes**
After the completion of the course the student should be able to	
CSDLO7032.1	Understand the key issues in big data management and its associated applications for business decisions and strategy.
CSDLO7032.2	Develop problem solving and critical thinking skills in fundamental enabling techniques like Hadoop, Mapreduce and NoSQL in big data analytics.
CSDLO7032.3	Collect, manage, store, query and analyze various forms of Big Data.
CSDLO7032.4	Interpret business models and scientific computing paradigms, and apply software tools for big data analytics.
CSDLO7032.5	Adapt adequate perspectives of big data analytics in various applications like recommender systems, social media applications etc.
CSDLO7032.6	Solve Complex real world problems in various applications like recommender systems, social media applications, health and medical systems, etc.
Subject Name :Big Data & Analytics	
Subject Code :CSDLO7032	
Course Code:CSDLO7032	
Course Code	**Course Outcomes**
After the completion of the course the student should be able to	
CSDLO7032.1	Understand the key issues in big data management and its associated applications for business decisions and strategy.

CSDLO7032.2	Develop problem solving and critical thinking skills in fundamental enabling techniques like Hadoop, Mapreduce and NoSQL in big data analytics.
CSDLO7032.3	Collect, manage, store, query and analyze various forms of Big Data.
CSDLO7032.4	Interpret business models and scientific computing paradigms, and apply software tools for big data analytics.
CSDLO7032.5	Adapt adequate perspectives of big data analytics in various applications like recommender systems, social media applications etc.
CSDLO7032.6	Solve Complex real world problems in various applications like recommender systems, social media applications, health and medical systems, etc.
Subject Name :Cyber Security and Laws	
Subject Code :ILO 7016	
Course Code:ILO 7016	
Course Code	**Course Outcomes**
After the completion of the course the student should be able to	
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
Subject Name :Management Information System	
Subject Code :ILO 7013	
Course Code: ILO 7013	
Course Code	**Course Outcomes**
After the completion of the course the student should be able to	

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
Subject Name :Digital Signal & Image Processing Lab	
Subject Code :CSL701	
Course Code:CSL701	
Course Code	**Course Outcomes**
After the completion of the course the student should be able to	
CSL701.1	Sample and reconstruct the signal.
CSL701.2	Implement and apply operations like Convolution, Correlation, DFT and FFT on DT signals
CSL701.3	Implement spatial domain Image enhancement techniques.
CSL701.4	Implement Edge detection techniques using first order derivative filters.
Subject Name :Mobile Application Development Lab	
Subject Code :CSL702	
Course Code:CSL702	
Course Code	**Course Outcomes**
After the completion of the course the student should be able to	
CSL702.1	Develop and demonstrate mobile applications using various tools

CSL702.2	Students will articulate the knowledge of GSM, CDMA & Bluetooth technologies and demonstrate it.
CSL702.3	Students will able to carry out simulation of frequency reuse , hidden terminal problem
CSL702.4	Develop security algorithms for mobile communication network
CSL702.5	Demonstrate simulation and compare the performance of Wireless LAN
CSL702.6	Implement and demonstrate mobile node discovery and route maintains.
Subject Name :Artificial Intelligence & Soft Computing Lab	
Subject Code :CSL703	
Course Code:CSL703	
Course Code	**Course Outcomes**
After the completion of the course the student should be able to	
CSL703.1	To realize the basic techniques to build intelligent systems
CSL703.2	To create knowledge base and apply appropriate search techniques used in problem solving.
CSL703.3	Apply the supervised/unsupervised learning algorithm.
CSL703.4	Design fuzzy controller system.
Subject Name :Computational Lab-I	
Subject Code :CSL704	
Course Code:CSL704	
Course Code	**Course Outcomes**
After the completion of the course the student should be able to	
CSL704.1	Acquire practical knowledge within the chosen area of technology for project development.

CSL704.2	Identify, discuss and justify the technical aspects of the chosen project with a comprehensive and systematic approach.
Subject Name :Computational Lab-I	
Subject Code :CSP705	
Course Code:CSP705	
Course Code	**Course Outcomes**
After the completion of the course the student should be able to	
CSP705.1	Identify the problem from in real world scenario
CSP705.2	Review literature , analyze current trends in society and industry .
CSP705.3	Formulate the problem statement
CSP705.4	Design engineering solutions to complex problems utilizing a systematic approach.
CSP705.5	Illustrate team work, communication skills for presentation of project related activities.
Subject Name :Human Machine Interaction	
Subject Code :CSC801	
Course Code:CSC801	
Course Code	**Course Outcomes**
After the completion of the course the student should be able to	
CSC801.1	Identify User Interface (UI) design principles.
CSC801.2	Analysis of effective user friendly interfaces.
CSC801.3	Apply Interactive Design process in real world applications.
CSC801.4	Evaluate UI design and justify.

CSC801.5	Create application for social and technical task.
Subject Name :Distributed Computing	
Subject Code :CSC802	
Course Code:CSC802	
Course Code	**Course Outcomes**
After the completion of the course the student should be able to	
CSC802.1	Demonstrate knowledge of the basic elements and concepts related to distributed system technologies;
CSC802.2	Illustrate the middleware technologies that support distributed applications such as RPC, RMI and Object based middleware.
CSC802.3	Analyze the various techniques used for clock synchronization and mutual exclusion
CSC802.4	Demonstrate the concepts of Resource and Process management and synchronization algorithms
CSC802.5	Demonstrate the concepts of Consistency and Replication Management
CSC802.6	Apply the knowledge of Distributed File System to analyze various file systems like NFS, AFS and the experience in building large-scale distributed applications
Subject Name :Natural Language Processing	
Subject Code :DLO8012	
Course Code:DLO8012	
Course Code	**Course Outcomes**
After the completion of the course the student should be able to	
DLO8012.1	Have a broad understanding of the field of natural language processing.
DLO8012.2	Have a sense of the capabilities and limitations of current natural language technologies,
DLO8012.3	Be able to model linguistic phenomena with formal grammars.

DLO8012.4	Be able to Design, implement and test algorithms for NLP problems
DLO8012.5	Understand the mathematical and linguistic foundations underlying approaches to the various areas in NLP
DLO8012.6	Be able to apply NLP techniques to design real world NLP applications such as machine translation, text categorization, text summarization, information extraction...etc
Subject Name :Project Management	
Subject Code :ILO8021	
Course Code:ILO8021	
Course Code	**Course Outcomes**
After the completion of the course the student should be able to	
ILO 8021.1	Apply selection criteria and select an appropriate project from different options.
ILO 8021.2	Write work break down structure for a project and develop a schedule based on it.
ILO 8021.3	Identify opportunities and threats to the project and decide an approach to deal with them strategically.
ILO 8021.4	Use Earned value technique and determine & predict status of the project.
ILO 8021.5	Capture lessons learned during project phases and document them for future reference
Subject Name : Environmental Management	
Subject Code :ILO8029	
Course Code:ILO8029	
Course Code	**Course Outcomes**
After the completion of the course the student should be able to	
ILO8029.1	Understand the concept of environmental management
ILO8029.2	Understand ecosystem and interdependence, food chain etc.

ILO8029.3	Understand and interpret environment related legislations
Subject Name : Human Machine Interaction Lab	
Subject Code :CSL801	
Course Code:CSL801	
Course Code	**Course Outcomes**
After the completion of the course the student should be able to	
CSC801.1	Design user centric interfaces.
CSC801.2	Design innovative and user friendly interfaces.
CSC801.3	Apply HMI in their day-to-day activities.
CSC801.4	Criticize existing interface designs, and improve them.
CSC801.5	Design application for social Task.
CSC801.6	Design application for Technical Tasks
Subject Name : Distributed Computing Lab	
Subject Code :CSL802	
Course Code:CSL802	
Course Code	**Course Outcomes**
After the completion of the course the student should be able to	
CSL802.1	Develop, test and debug RPC/RMI based client-server programs.
CSL802.2	Implement the main underlying components of distributed systems (such as IPC, name resolution file systems etc.)
CSL802.3	Implement various techniques of synchronization.

CSL802.4	Design and implement application programs on distributed systems.
Subject Name : Cloud Computing Lab	
Subject Code :CSL803	
Course Code:CSL803	
Course Code	**Course Outcomes**
After the completion of the course the student should be able to	
CSL803.1	Adapt different types of virtualization and increase resource utilization.
CSL803.2	Build a private cloud using open source technologies.
CSL803.3	Analyze security issues on cloud.
CSL803.4	Develop real world web applications and deploy on commercial cloud.
CSL803.5	Demonstrate various service models
Subject Name : Computational Lab-II	
Subject Code :CSL804	
Course Code:CSL804	
Course Code	**Course Outcomes**
After the completion of the course the student should be able to	
CSL804.1	Acquire practical knowledge within the chosen area of technology for project development.
CSL804.2	Identify, discuss and justify the technical aspects of the chosen project with a comprehensive and systematic approach.
Subject Name : Major Project- II	
Subject Code :CSP805	

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Course Code:CSP805	
Course Code	**Course Outcomes**
After the completion of the course the student should be able to	
CSP805.1	Develop technological solution for the chosen problem statement
CSP805.2	Write test cases to demonstrate the results of the project
CSP805.3	Analyze the obtained results,
CSP805.4	Report the findings in documented format
CSP805.5	Apply professional ethics to demonstrate knowledge using project management

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Department of Electronics and Telecommunication

Course Name: ECC 301 Engineering Mathematics- III Year of Study: 2020-21	
ECC 301.1	Understand the concept of Laplace Transform of and its application to solve the real integrals in Engineering Problem .
ECC 301.2	Understand the concept of Inverse Laplace Transform of various function 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 Year of Study: 2020-21	
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: 2020-21	
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-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: 2020-21	
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: 2020-21	
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: ECL301 Electronic Devices and Circuits I Laboratory Year of Study: 2020-21	
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: 2020-21	
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: 2020-21	
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: ECL304 Skill Lab-: C++ and Java Programming Year of Study: 2020-21	
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

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Course Name: ECM301 Mini Project 1-A Year of Study: 2020-21	
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: 2020-21	
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: 2020-21	
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: 2020-21	
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: 2020-21	
ECC 404.1	Classify and Analyze 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	Analyze 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: 2020-21	
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: 2020-21	
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: 2020-21	
ECL402.1	Describe the fundamentals properties of Operational Amplifier
ECL402.2	Analyze Operational Amplifier as Inverting, Non inverting 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: 2020-21	
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: 2020-201	
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: 2020-201	
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 Microprocessor & Peripherals Interfacing Year of Study: 2020-21	
ECC501.1	Draw the architecture and pin diagram of 8086 microprocessor.
ECC501.2	write an assembly language program for the given task
ECC501.3	Interface (draw interfacing and write interfacing program) peripherals 8255, 8254, 8259A and 8257 with 8086.
ECC501.4	Explain 8086 based data acquisition system.
ECC501.5	Interface 8087 Math co-processor with 8086.
ECC501.6	Design a system with given memory (RAM, ROM, and EPROM) specifications interfaced with 8086.

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Course Name: ECC502 Digital Communication Year of Study: 2020-21	
ECC502.1	Understand the basics of digital communication, probability theory.
ECC502.2	Apply fundamental concept of information theory in source coding.
ECC502.3	Understand the basics of significance of line coding in digital communication
ECC502.4	Evaluate the effect of ISI on digital communication system
ECC502.5	Compare bandpass modulation and baseband modulation techniques.
ECC502.6	Evaluate performance of error control codes.
Course Name:ECC503 Electromagnetic Engineering Year of Study: 2020-21	
ECC503.1	Understand the Electrostatics in free space on the basis of Coulomb's and Gauss's Law.
ECC503.2	Understand the Electrostatics in Material space on the basis Energy Density and Current Density polarization and capacitance within and at the boundaries of media.
ECC503.3	Analyze the Steady Magnetic Fields within and at the boundaries of media
ECC503.4	Understand Maxwell's Equation and Electromagnetic Wave Propagation in Space
ECC503.5	Analyze Electromagnetic Wave Propagation within transmission lines and various characteristics of the transmission line
ECC503.6	Understand the applications of Electromagnetic
Course Name: ECC504 Discrete Time Signal Processing Year of Study: 2020-21	
ECC504.1	Understand the concepts of discrete-time Fourier transform and fast Fourier transform.
ECC504.2	Apply the knowledge of design of IIR digital filters to meet arbitrary specifications.
ECC504.3	Apply the knowledge of design of FIR digital filters to meet arbitrary specifications.
ECC504.4	Apply the knowledge of DSP processors for various applications.
ECC504.5	Design and simulate digital filters
ECC504.6	Apply algorithms of DSP for real time applications

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Course Name: ECCDLO 5014 Data Compression and Encryption Year of Study: 2020-21	
ECCDLO 5014.1	Apply fundamental concept of data compression and coding
ECCDLO 5014.2	Identify software tools/algorithms used for data compression
ECCDLO 5014.3	Apply text, audio, video compression techniques .
ECCDLO 5014.4	Apply text, encryption techniques
ECCDLO 5014.5	Analyze symmetric and asymmetric key cryptography
ECCDLO 5014.6	Understand network security and ethical hacking
Course Name: ECCDLO 5012 Television & Video Engineering Year of Study: 2020-21	
ECCDLO5012.1	Explain overview of TV system.
ECCDLO5012.2	Describe details of colour television systems
ECCDLO5012.3	Understand details of compression technique.
ECCDLO5012.4	Compare different digital video broadcasting techniques
ECCDLO5012.5	Explain advanced digital systems
ECCDLO5012.6	Differentiate between different types of displays.
Course Name: ECC501 Microprocessor & Peripherals Interfacing Lab Year of Study: 2020-21	
ECL501.1	Understand architecture, addressing modes and instruction set of 8086
ECL501.2	Apply the fundamentals of assembly level programming of microprocessors.
ECL501.3	Build a program on a microprocessor using an arithmetic & logical instruction set of 8086.
ECL501.4	Develop the assembly level programming using an 8086 loop instruction set.
ECL501.5	Write programs based on Rotate & Shift instructions for 8086 microprocessors.
ECL501.6	Analyze abstract problems based on a combination of hardware and software.

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Course Name: ECL502 Digital Communication Lab Year of Study: 2020-21	
ECL502.1	Understand the basics of digital signal and significance of line coding in digital communication
ECL502.2	Apply fundamental concept of information theory in source coding
ECL502.3	Evaluate the effect of ISI on digital communication system
ECL502.4	Compare band pass modulation techniques
ECL502.5	Evaluate performance of error control codes
Course Name: ECL503 Business Communication & Ethics Lab Year of Study: 2020-21	
ECL503 .1	Design a technical document using precise language, suitable vocabulary and apt style.
ECL503 .2	Develop the life skills/ interpersonal skills to progress professionally by building stronger relationships.
ECL503 .3	Demonstrate awareness of contemporary issues knowledge of professional and ethical responsibilities.
ECL503 .4	Apply the traits of a suitable candidate for a job/higher education, upon being trained in the techniques of holding a group discussion, facing interviews and writing resume/SOP.
ECL503 .5	Deliver formal presentations effectively implementing the verbal and non-verbal skills.
Course Name: ECL504 Open Source Technology for Communication Lab Year of Study: 2020-21	
ECL504.1	Learn open source programming tools like LTSPICE, SCILAB, PYTHON, and SEQUEL.
ECL504.2	Design and Simulate various analog and digital circuits using open sources tools.
ECL504.3	Analyze the performance of the analog and digital circuits using open sources tools.
ECL504.4	Implement the software tools to build or create the projects on communication systems.
Course Name: ECLDLO 5014 Data Compression and Encryption Lab Year of Study: 2020-21	
ECLDLO 5014.1	Apply fundamental concept of data compression and coding
ECLDLO 5014.2	Use software tools/algorithms used for data compression

ECLDLO 5014.3	Implement text, audio, video compression and encryption techniques
ECLDLO 5014.4	Analyze symmetric and asymmetric key of cryptography
ECLDLO 5014.5	Use network security and ethical hacking software tools/algorithms
Course Name: ECLDLO 5012 Television & Video Engineering Lab Year of Study: 2020-21	
ECLDLO 5012.1	Explain overview of TV system.
ECLDLO 5012.2	Describe the chroma theory used in colour Television
ECLDLO 5012.3	Compare the details of compression technique.
ECLDLO 5012.4	Differentiate the different dvb standards.
ECLDLO 5012.5	Analyze advanced digital systems.
ECLDLO 5012.6	Describe the different types of displays
Course Name: ECC601 Microcontrollers & Applications Year of Study: 2020-21	
ECC601.1	Understand the detailed architecture of 8051 Microcontroller.
ECC601.2	Implement Arithmetical, Logical and Loop operations using direct and indirect addressing mode.
ECC601.3	Interface various peripheral device to the microcontroller (DC motor or seven segment Display)
ECC601.4	Understand the detailed architecture of ARM7 microcontroller
ECC601.5	Understand addressing modes and ARM7 Programming
ECC601.6	Write Assembly language and Embedded C program for microcontrollers
Course Name: ECC602 Computer Communication Networks Year of Study: 2020-21	
ECC602.1	Analyze a computer network including media types, end devices, and interconnecting devices that meets a customer 's specific needs.
ECC602.2	Describe different network media and basic configurations on routers and Ethernet switches.
ECC602.3	Analyze the traffic flow, error control and the contents of protocol frames.

ECC602.4	Analyze channel allocation in computer networks and related results.
ECC602.5	Examine connectivity problems in a host occurring at multiple layers of the OSI model.
ECC602.6	Describe knowledge related to Transport layer, also get skills necessary to gain employment as computer network engineer and network administrator
Course Name: ECC603 Antenna & Radio Wave Propagation Year of Study: 2020-21	
ECC603.1	Define fundamental parameters of Antenna
ECC603.2	Design various wire antennas like dipole , monopole, loop or helical antenna
ECC603.3	Design of uniform linear and planar antenna arrays using isotropic and directional Sources.
ECC603.4	Design Horn and Reflectors Antenna
ECC603.5	Design Patch Antenna
ECC603.6	Measure various parameters of the various antennas
Course Name: ECC604 Image Processing and Machine Vision Year of Study: 2020-21	
ECC604.1	Describe theory and models in image processing for image sensing and acquisition.
ECC604.2	Analyze 2D signals in Spatial and frequency domain through image transforms
ECC604.3	Apply different image enhancement techniques
ECC604.4	Apply quantitative models of image processing for morphology and restoration for various applications.
ECC604.5	Apply quantitative models of image processing for different image segmentation techniques.
ECC604.6	Classify shape using various representation techniques and the object using different classification methods.
Course Name: ECLDLO 6021 Digital VLSI Design Year of Study: 2020-21	
ECCDLO 6021.1	Realize combinational & sequential Circuits with different design styles
ECCDLO 6021.2	Analyze memory circuits
ECCDLO 6021.3	Design data path elements

ECCDLO 6021.4	Analyze clocking issues such as protection & routing
ECCDLO 6021.5	Simulate digital circuits using HDL language
ECCDLO 6021.6	Analyze RTL Design Techniques & Methodologies
Course Name: DBMS Year of Study: 2020-21	
ECCDLO6023.1	Understand the need of database management systems.
ECCDLO6023.2	Design ER and EER diagrams for real-life applications.
ECCDLO6023.3	Convert ER and EER model to Relational Model.
ECCDLO6023.4	Design database using SQL.
ECCDLO6023.5	Apply the concept of normalization to relational database design.
ECCDLO6023.6	Understand the concept of transaction, concurrency, and recovery.
Course Name: ECL601 Microcontroller & Applications Lab Year of Study: 2020-21	
ECL601.1	Understand and explain new simulator for 8051 microcontrollers.
ECL601.2	Implement Arithmetical, Logical and Loop operations using direct and indirect addressing mode.
ECL601.3	Interface various peripheral device to the microcontroller (DC motor or seven segment Display)
ECL601.4	Construct microcontroller-based system for various applications
Course Name: ECL602 Computer Communication Network Lab Year of Study: 2020-21	
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	Learn to simulate computer networks and analyze the simulation results.
ECL602.5	Analyze 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
Course Name: ECL603 Antenna & Radio Wave Propagation Lab Year of Study: 2020-21	
ECL603.1	Define fundamental parameters of Antenna
ECL603.2	Design various wire antennas like dipole , monopole, loop or helical antenna
ECL603.3	Design of uniform linear and planar antenna arrays using isotropic and directional Sources.
ECL603.4	Design Horn and Reflectors Antenna
ECL603.5	Design Patch Antenna
ECL603.6	Measure various parameters of the various antennas
Course Name: ECL604 Image Processing and Machine Vision Lab Year of Study: 2020-21	
ECL604.1	Construct models using concept of fundamentals of image processing, sensing and acquisition.
ECL604.2	Analyze 2D signals in frequency domain through image transforms.
ECL604.3	Apply different image enhancement techniques
ECL604.4	Apply quantitative models of image processing for morphology and restoration for various applications
ECL604.5	Apply quantitative models of image processing for segmentation
ECL604.6	Classify various representation techniques and the object using different classification methods.
Course Name: ECLDLO 6021 Digital VLSI Design Lab Year of Study: 2020-21	
ECLDLO 6021.1	Realize combinational & sequential Circuits with different design styles
ECLDLO 6021.2	Analyze memory circuits
ECLDLO 6021.3	Simulate digital circuits using HDL language
Course Name: ECLDLO 6022 DBMS Lab Year of Study: 2020-21	
ECLDLO 6023.1	Design ER and EER diagrams for real-life applications.

ECLDLO 6023.2	To understand DDL & DML commands in SQL
ECLDLO 6023.3	To apply the concept of normalization in DBMS
ECLDLO 6023.4	To understand the concepts of constraints in SQL
ECLDLO 6023.5	To apply the concepts of views and triggers in SQL
ECLDLO 6023.6	To implement transaction management in SQL
Course Name: ECC701 Microwave Engineering Year of Study: 2020-21	
ECC701.1	Analyze the microwave passive circuit components using S parameters
ECC701.2	Design of Impedance Matching Network using distributed and lumped elements
ECC701.3	Identify the state of art in microwave tubes and their application
ECC701.4	Identify the state of art in microwave semiconductor devices and their application
ECC701.5	Understand various Microwave Measurement Techniques
ECC701.6	Understand microwave integrated circuits
Course Name:ECC702 Mobile Communication System Year of Study: 2020-21	
ECC702.1	Understand the cellular fundamentals and estimate the coverage and capacity of cellular systems.
ECC702.2	Classify different types of propagation models and analyze the link budget.
ECC702.3	Illustrate the fundamentals and system architecture of GSM, 2.5G and IS-95.
ECC702.4	Apply the concepts of 3G technologies of UMTS and CDMA 2000.
ECC702.5	Elaborate the principles of 3GPP LTE.
ECC702.6	Identify the emerging technologies for upcoming mobile communication systems.
Course Name: ECC703 Optical Communication Year of Study: 2020-21	

ECC703.1	Understand basic principles of optical fiber communication to find Critical Angle, Numerical Aperature, Acceptance Angle, Normalize Frequency as V number & Guided Modes.
ECC703.2	Apply transmission characteristics of optical fiber to find different types of losses
ECC703.3	Analyze optical sources to find best sources for an optical fiber communication.
ECC703.4	Analyze optical detectors to find best detectors for an optical fiber communication.
ECC703.5	Understand fiber fabrication process & fiber components.
ECC703.6	Evaluate parameters for optical link power budgeting and rise time budget to analyze the link.
Course Name:ECCDLO7032 Big Data analytics Year of Study: 2020-21	
ECCDLO7032.1	Explain fundamentals of Big data analytics.
ECCDLO7032.2	Explain how Hadoop framework can be used solve big data analytics problems.
ECCDLO7032.3	Explain use of No SQL to handle big data analytics problems.
ECCDLO7032.4	Apply Map reduce techniques to handle big data analytics problems.
ECCDLO7032.5	Explain use of big data analytics techniques in finding similar items, mining data streams, link analysis and frequent itemset mining.
ECCDLO7032.6	Explain applications of big data analytics in recommendation systems and mining social network graphs.
Course Name: ECCDLO7033 Internet Communication Engineering Year of Study: 2020-21	
ECCDLO 7033.1	Analyze the application layer protocols including DHCP, DNS, TELNET, SMTP and root server
ECCDLO 7033.2	Analyze Transport layer protocol for process-to-process communication
ECCDLO 7033.3	Implement local area networks using static and dynamic addressing techniques including sub netting
ECCDLO 7033.4	Apply voice over internet protocol & real time interactive audio & Video services in real life application
ECCDLO 7033.5	Understand the system design principles of multimedia communications systems.
ECCDLO 7033.6	Understand the quality of services for Multimedia Communication

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Course Name: ECCDLO7035 Embedded System Year of Study: 2020-21	
ECCDLO7035.1	Understand the Architecture and Components of an Embedded System
ECCDLO7035.2	Understand the detailed processor design concept
ECCDLO7035.3	Understand the various methods of Communication
ECCDLO7035.4	Understand the concepts of RTOS and write programs
ECCDLO7035.5	Understand interprocess and task communication
ECCDLO7035.6	Design an embedded system for various applications
Course Name: ILO7017 Disaster Management and Mitigation Measures Year of Study: 2020-21	
ECCILO7017.1	Get to know natural as well as manmade disaster and their extent and possible effects on economy.
ECCILO7017.2	Plan of national importance structures based upon the previous history.
ECCILO7017.3	Get aquinted with Government policies, acts and various organizational structure associated with an emergency.
ECCILO7017.4	Get to know the simple Do's and Don its in such extreme events and act accordingly.
Course Name: ILO701 Cyber Security & Law Year of Study: 2020-21	
ECCILO7016.1	Understand the concept of Cybercrime and its effect on the outside world.
ECCILO7016.2	Understand various cyber offenses and attacks on mobile and wireless devices.
ECCILO7016.3	Understand the various tools and methods used in cybercrime.
ECCILO7016.4	Interpret and apply IT law in various legal issues.
ECCILO7016.5	Distinguish different aspects of cyber law.
Course Name: ECL701 Microwave Engineering Lab Year of Study: 2020-21	
ECL701.1	Analyze the microwave passive circuit components using S parameters
ECL701.2	Design of Impedance Matching Network using distributed and lumped elements

ECL701.3	Identify the state of art in microwave tubes and their application
ECL701.4	Identify the state of art in microwave semiconductor devices and their application
ECL701.5	Understand various Microwave Measurement Techniques
ECL701.6	Understand microwave integrated circuits
Course Name: ECL702 Mobile Communication Lab Year of Study: 2020-21	
ECL702.1	Apply the fundamentals of Mobile communication to design the wireless Network
ECL702.2	Demonstrate the GSM and CDMA architecture
ECL702.3	Interpret the evolving wireless communication technologies
ECL702.4	Describe the emerging technologies required for fourth generation mobile system
Course Name: ECL703 Optical Communication Lab Year of Study: 2020-21	
ECL703.1	Apply Single Mode Operation, Optical fiber waveguide to find fiber parameters and Numerical Aperture (NA) in optical fiber.
ECL703.2	Apply material dispersion at various wavelength & transmission characteristics to fine losses in optical link
ECL703.3	Analyze optical source & detector with optical link to find input verses output characteristic of LED and the responsitivity curve for the given photodetector material, received optical power, the number of photons received by a PN photodiode.
ECL703.4	Evaluate the link power & rise time budget for the optical link with given parameters.
Course Name: ECLDLO7033 Internet Communication Engineering Lab Year of Study: 2020-21	
ECLDLO 7033.1	Analyze the application layer protocols including DHCP, DNS, TELNET, SMTP and root server.
ECLDLO 7033.2	Analyze Transport layer protocol for process-to-process communication.
ECLDLO 7033.3	Implement local area networks using static and dynamic addressing techniques including sub netting.
ECLDLO 7033.4	Apply voice over internet protocol & real time interactive audio & Video services in real life application

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Course Name: ECLDLO7032 Big Data Analytics Lab Year of Study: 2020-21	
ECLDLO7032.1	Implement big data processing using Hadoop components on virtual platform..
ECLDLO7032.2	Implement big data processing using NoSQL components on virtual platform..
ECLDLO7032.3	Implement big data analytics on virtual platform..
ECLDLO7032.4	Implement big data analytics for weather prediction on virtual platform..
ECLDLO7032.5	Implement twitter data analytics using twitter development platform and tweepy.
Course Name: ECLDLO7035 Embedded System Lab Year of Study: 2020-21	
ECCDLO7035.1	Write basic programs for Embedded systems
ECCDLO7035.2	Understand the SPI, I2C communication in Embedded Systems
ECCDLO7035.3	Write programs for ARM microcontroller
ECCDLO7035.4	Write programs related to RTOS
ECCDLO7035.5	Simulate multitasking using RTOS
	Simulate multitasking using RTOS
Course Name: ECL704 Project-I Year of Study: 2020-21	
ECL704.1	Apply Engineering Knowledge and concepts to arrive at design solutions for a given problem.
ECL704.2	Analyze engineering problem using research literature to find gaps in existing knowledge.
ECL704.3	Apply research-based knowledge and design experiments to solve an engineering problem.
ECL704.4	Identify the end user that shall benefit through the proposed solution of system and also demonstrate concern for environment and abide by professional ethics.
ECL704.5	Demonstrate teamwork and communication principles while planning projects, writing reports and giving presentations
ECL704.6	Apply project life cycle principles by project scheduling and managing finances.
Course Name: ECC801 RF Design Year of Study: 2020-21	

ECC801.1	Design Passive RF filters using Image parameter method and Insertion Loss Method
ECC801.2	Design Microwave Amplifiers using Analytical Method and Smith chart
ECC801.3	Design Microwave Oscillators using Analytical Method and Smith chart
ECC801.4	Understand the basic principle and operation and Frequency Synthesizers
ECC801.5	Understand Electromagnetic Interference in RF circuit
ECC801.6	Understand Electromagnetic Compatibility in RF circuit
Course Name:ECC802 Wireless Networks Year of Study: 2020-21	
ECC802.1	Understand the fundamentals, architecture, design issues of Wireless Networks and Body Area Networks
ECC802.2	Apply various Wireless Personal Area Networks such as Bluetooth, Zigbee, RFID, NFC and UWB.
ECC802.3	Analyze various types of Local Area Network topologies and technologies to find LAN topologies.
ECC802.4	Evaluate parameters for Wireless Wide Area Network for Radio Link and Coverage planning and also link budgets for GSM,CDMA,CDMA2000,HSPD and analyze link.
ECC802.5	Understand various Wireless adhoc Networks architecture, traffic related protocols and transmission technology.
ECC802.6	Apply various Wireless Sensors Networks, Wireless Mesh Network and Internet of Things
Course Name:ECCDLO8043 Satellite Communication Year of Study: 2020-21	
ECCDLO8043.1	Interpret key geometric parameters for satellite orbits in order to predict satellites location and correctly orient earth station antenna.
ECCDLO8043.2	Provide in depth understanding of satellite communication system operation, launching techniques.
ECCDLO8043.3	Explain Earth station technology.
ECCDLO8043.4	Evaluate link feasible for a given set of constraints.
ECCDLO8043.5	Design satellite communication network to support multiple users.
ECCDLO8043.6	Use applications of satellite communication for benefit of society.

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Course Name: ECCDLO8044 Network management in Telecommunication Year of Study: 2020-21	
ECCDLO 8044.1	Explain the need for interoperable network management & analyze the trends and development of the telecommunications Network Management
ECCDLO 8044.2	Demonstrate broad knowledge of fundamental principles and technical standards underlying
ECCDLO 8044.3	Describe the concepts and architecture behind standards-based network management associated with SNMP and CMIP
ECCDLO 8044.4	Apply basic of telecommunication, networking and information technologies and architect and implement networked informative systems
ECCDLO 8044.5	Continuously improve communication skills
ECCDLO 8044.6	Analyze packet or traffic in the network.
Course Name:ILO8029 Environmental Management Year of Study: 2020-21	
ILO8029.1	Understand the concept of Environmental Management
ILO8029.2	Understands the Global Environmental concerns
ILO8029.3	Understand Ecosystem ,Interdependence and Food chain
ILO8029.4	Understand and interpret environment related legislation
Course Name: ECL801 RF Design Lab Year of Study: 2020-21	
ECL801.1	Design Passive RF filters using Image parameter method and Insertion Loss Method
ECL801.2	Design Microwave Amplifiers using Analytical Method and Smith chart
ECL801.3	Design Microwave Oscillators using Analytical Method and Smith chart
ECL801.4	Understand the basic principle and operation and Frequency Synthesizers
ECL801.5	Understand Electromagnetic Interference and Electromagnetic Compatibility in RF circuit
Course Name: ECL802 Wireless Networks Lab Year of Study: 2020-21	
ECL802.1	Understand Various Hardware , Software aspects of Wireless Networks, NS2 and Wireless Software

ECL802.2	Analyze to get distance Measurement using Ultrasonic sensors and send it on Android device using Bluetooth
ECL802.3	Evaluate Implementation of Frequency Hopping
ECL802.4	Analyze yje capacity of GSM system and Uplink and downlink budget for GSM 1800
ECL802.5	Analyze to estimate a mean signal required at Base station, mobile station and determine the cell radius and also two nodes wireless networks
ECL802.6	Create the wireless network based mini project for various application
Course Name: ECLDLO8043 Satellite Communication Lab Year of Study: 2020-21	
ECLDLO8043.1	Decide height of a satellite to trade off between coverage area, slant range and propagation delay.
ECLDLO8043.2	Set limit of visibility by choosing proper value of longitude & latitude.
ECLDLO8043.3	Design gain of antenna to deliver output power if input power of antenna is given.
ECLDLO8043.4	Design a gain of antenna for a given EIRP.
ECLDLO8043.5	Calculate C/N,CNT for given up link, down link of satellite communication link.
Course Name: ECLDLO8044 Network management in Telecommunication Lab Year of Study: 2020-21	
ECLDLO 8044.1	Analyze the need for interoperable network management , the trends and development of the telecommunications Network Management
ECLDLO 8044.2	Demonstrate broad knowledge of fundamental principles and technical standards underlying
ECLDLO 8044.3	Describe the concepts and architecture behind standards-based network management associated with SNMP and CMIP
ECLDLO 8044.4	Apply basic of telecommunication, networking and information technologies and architect and implement networked informative systems
ECLDLO 8044.5	Continuously improve communication skills
ECLDLO 8044.6	Analyze packet or traffic in the network.
Course Name: ECL803 Project-II Year of Study: 2020-21	
ECL803.1	Implement project using modern tools and techniques with latest hardware and software.
ECL803.2	Design project which solves research problem identifies by reviewing literature.
ECL803.3	Demonstrate teamwork and communication principles while planning projects, writing reports and giving presentations.

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ECL803.4	Apply project life cycle principles by project scheduling and managing finances.
ECL803.5	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.
ECL803.6	Design a project/product which will be useful to the society addressing environment concerns and abiding by ethical principles

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Department of Humanities & Applied Science

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 numbers to 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 of linear and simultaneous algebraic equations.
Subject Name : Engineering Physics-I	
Subject Code : FEC102	
Course Code : FEC102	
Course Code	**Course Outcomes**
	After the completion of the course the student should be able to
FEC102.1	Illustrate the fundamentals of quantum mechanics and its application.
FEC102.2	Apply the X-ray diffraction techniques for explaining peculiar properties of crystal.
FEC102.3	Illustrate the working of semiconductor for electronic devices.
FEC102.4	Employ the concepts of interference in thin films for instruments.
FEC102.5	Discuss the properties of superconductors and super capacitors.

FEC102.6	Discuss the properties of engineering materials for their current and futuristic use.

Subject Name : Engineering Chemistry-I	
Subject Code : FEC103	
Course Code : FEC103	
Course Code	**Course Outcomes**
	After the completion of the course the student should be able to
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	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	
Course Code	**Course Outcomes**
	After the completion of the course the student should be able to
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 understand its significance.

FEC104.3	Estimate friction force and required force to overcome friction.
FEC104.4	Analyze motion by graphical and algebraic methods and establish relation between velocity and acceleration of a particle.
FEC104.5	Analyze types of motions and kinematic relations for a rigid body.
FEC104.6	Analyze the body in motion using force and acceleration, work-energy, impulse momentum principles.

Subject Name : Basic Electrical Engineering	
Subject Code : FEC105	
Course Code : FEC105	
Course Code	**Course Outcomes**
	After the completion of the course the student should be able to
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	
Course Code	**Course Outcomes**
	After the completion of the course the student should be able to
FEL101.1	Analyze the results based on performance of experiments on interference in thin films.

FEL101.2	Analyze the characteristics of semiconductor 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	
Course Code	**Course Outcomes**
	After the completion of the course the student should be able to
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	
Course Code	**Course Outcomes**
	After the completion of the course the student should be able to
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	
Course Code	**Course Outcomes**
	After the completion of the course the student should be able to
FEL104.1	Analyze the behavior 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	
Course Code	**Course Outcomes**
	After the completion of the course the student should be able to
FEL105.1	Develop the necessary skills required to produce fitting jobs as per specified dimensions.
FEL105.2	Understand hardware maintenance and installation of an operating system.
FEL105.3	Understand installation of an operating system and system drives.
FEL105.4	Understand the network components and perform basic networking.
FEL105.5	Demonstrate the turning operation with the help of a simple job.
Subject Name : Engineering Mathematics-II	
Subject Code : FEC201	
Course Code : FEC201	

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Course Code	Course Outcomes
	After the completion of the course the student should be able to
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	
Course Code	**Course Outcomes**
	After the completion of the course the student should be able to
FEC202.1	Describe the phenomenon of diffractions through slits.
FEC202.2	Apply the foundation of laser and fiber optics in the 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 special theory of relativity in inertial frame of references.
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.
Subject Name : Engineering Chemistry-II	
Subject Code : FEC203	

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Course Code : FEC203	
Course Code	**Course Outcomes**
	After the completion of the course the student should be able to
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	
Course Code	**Course Outcomes**
	After the completion of the course the student should be able to
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.

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FEC204.6	Visualize an object from the given two views.
Subject Name : C Programming	
Subject Code : FEC205	
Course Code : FEC205	
Course Code	**Course Outcomes**
	After the completion of the course the student should be able to
FEC205.1	Formulate simple algorithms for arithmetic, logical problems and translate them to programs in C language.
FEC205.2	Implement, test and execute programs comprising of control structures.
FEC205.3	Decompose a problem into functions and synthesize a complete program.
FEC205.4	Demonstrate the use of arrays, strings and structures in C language.
FEC205.5	Understand the concept of pointers.
Subject Name : Professional Communication and Ethics- I	
Subject Code : FEC206	
Course Code : FEC206	
Course Code	**Course Outcomes**
	After the completion of the course the student should be able to
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 and 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 document.
FEC206.6	Successfully interact in all kinds of settings, displaying refined grooming and social skills.

Subject Name : Engineering Physics-II	
Subject Code : FEL201	
Course Code : FEL201	
Course Code	**Course Outcomes**
	After the completion of the course the student should be able to
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.
Subject Name : Engineering Chemistry-II	
Subject Code : FEL202	
Course Code : FEL202	
Course Code	**Course Outcomes**
	After the completion of the course the student should be able to
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	

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Subject Code : FEL203	
Course Code : FEL203	
Course Code	**Course Outcomes**
	After the completion of the course the student should be able to
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.
EL203.3	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.
Subject Name : C Programming	
Subject Code : FEL204	
Course Code : FEL204	
Course Code	**Course Outcomes**
	After the completion of the course the student should be able to
FEL204.1	Translate given algorithms to a program.
FEL204.2	Correct syntax and logical errors.
FEL204.3	Decompose a given problem into subproblems by writing functions.
FEL204.4	Write iterative as well as recursive programs.
FEL204.5	Represent data in arrays, strings and structures and manipulate them through a program.
FEL204.56	Declare pointers and demonstrate call by reference concept.
Subject Name : Professional Communication and Ethics- I	
Subject Code : FEL205	

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Course Code : FEL205	
Course Code	**Course Outcomes**
	After the completion of the course the student should be able to
FEL205.1	Listen and comprehend all types of spoken discourse successfully.
FEL205.2	Speak fluently and make effective professional presentations.
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	
Course Code	**Course Outcomes**
	After the completion of the course the student should be able to
FEL206.1	Develop necessary skill required to produce carpentry jobs as per specified dimensions.
FEL206.2	Understand the safe practices to adopt in electrical environment.
FEL206.3	Understand the wiring practices for the connection of simple electrical load/ equipment.
FEL206.4	Design printed circuit board.
FEL206.5	Develop the necessary skill required to use different sheet metal and brazing tools.

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Department of Information Technology

Subject Name :Applied Mathematics III	
Subject Code : ITC301	
Course Code :ITC301	
	After the completion of the course the student should be able to
Course Code	**Course Outcomes**
ITC301.1	Apply the concept of Laplace transform to solve the real integrals in engineering problems.
ITC301.2	Apply the concept of inverse Laplace transform of various functions in engineering problems.
ITC301.3	Expand the periodic function by using Fourier series for real life problems and complex engineering problems.
ITC301.4	Find orthogonal trajectories and analytic function by using basic concepts of complex variable theory.
ITC301.5	Apply the concept of Correlation and Regression to the engineering problems in data science, machine learning and AI.
ITC301.6	Illustrate understanding of the concepts of probability and expectation for getting the spread of the data and distribution of probabilities.
Subject Name :Data Structure and Analysis	
Subject Code : ITC302	
Course Code :ITC302	
	After the completion of the course the student should be able to
Course Code	**Course Outcomes**
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.
Subject Name :Database Management System	
Subject Code : ITC303	
Course Code :ITC303	
	After the completion of the course the student should be able to
Course Code	**Course Outcomes**
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 : Principles of Communication	
Subject Code : ITC304	
Course Code :ITC304	
	After the completion of the course the student should be able to
Course Code	**Course Outcomes**

ITC304.1	Describe analog and digital communication systems
ITC304.2	Differentiate types of noise, analyses the Fourier transform of time and frequency domain.
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 : Paradigms and Computer Programming Fundamentals	
Subject Code : ITC305	
Course Code :ITC305	
	After the completion of the course the student should be able to
Course Code	**Course Outcomes**
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.

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Lab Outcomes: Data Structure Lab (IT Understanding ITL 301)	
Course Code : ITL301	
Lab Code	**Lab Outcomes**
On successful completion, of course, learner/student will 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
Lab Outcomes: SQL LAB (ITL 302)	
Course Code : ITL302	
Lab Code	**Lab Outcomes**
On successful completion, of course, learner/student will be able to:	
ITL302.1	Define problem statement and Construct the conceptual model for real life application.
ITL302.2	Create and populate a RDBMS using SQL.
ITL302.3	Formulate and write SQL queries for efficient information retrieval
ITL302.4	Apply view, triggers and procedures to demonstrate specific event handling.
ITL302.5	Demonstrate database connectivity using JDBC.
ITL302.6	Demonstrate the concept of concurrent transactions.

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Lab Outcomes: Computer programming Paradigms Lab (ITL 303) Lab	
Course Code : ITL303	
Lab Code	**Lab Outcomes**
On successful completion, of course, learner/student will 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
Lab Outcomes: Java Lab (ITL 304)	
Course Code : ITL304	
Lab Code	**Lab Outcomes**
On successful completion, of course, learner/student will 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.

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Outcomes : Mini Project Java (ITM 301)	
Course Code : ITM301	
Course Outcome: Learner will be able to…	
Course Code	**Course Outcomes**
ITM301.1	Identify problems based on societal /research needs.
ITM301.2	Apply Knowledge and skill to solve societal problems in a group.
ITM301.3	Dvelop interpersonal skills to work as member of a group or leader.
ITM301.4	Draw the proper inferences from available results through theoretical/ experimental/simulations.
ITM301.5	Analyse the impact of solutions in societal and environmental context for sustainable development.
ITM301.6	Use standard norms of engineering practices
ITM301.7	Excel in written and oral communication.
ITM301.8	Demonstrate capabilities of self-learning in a group, which leads to life long learning.
Subject Name : Applied Mathematics- IV	
Subject Code : ITC401	
Course Code :ITC401	
After the completion of the course the student should be able to	
Course Code	**Course Outcomes**
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 integrals.
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 theory.
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	
Subject Code : ITC402	
Course Code :ITC402	
After the completion of the course the student should be able to	
Course Code	**Course Outcomes**
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	
Subject Code : ITC403	
Course Code :ITC403	
After the completion of the course the student should be able to	
Course Code	**Course Outcomes**
ITC403.1	Understand the basic concepts related to Operating System.

ITC403.2	Describe the process management policies and illustrate scheduling of processes by CPU.
ITC403.3	Explain and apply synchronization primitives conditions as handled by Operating System. and evaluate deadlock conditions as handled by Operating System.
ITC403.4	Describe and analyze the memory allocation and management functions of Operating System.
ITC403.5	Analyze and evaluate the services provided by Operating System for storage management.
ITC403.6	Compare the functions of various special-purpose Operating Systems.
Subject Name : Automata Theory	
Subject Code : ITC404	
Course Code :ITC404	
After the completion of the course the student should be able to	
Course Code	**Course Outcomes**
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.

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Subject Name : Computer Organization and Architecture	
Subject Code : ITC405	
Course Code :ITC405	
After the completion of the course the student should be able to	
Course Code	**Course Outcomes**
ITC405.1	Demonstrate the fundamentals of Digital Logic Design
ITC405.2	Describe basic organization of computer, the architecture of 8086 microprocessor and implement assembly language programming for 8086 microprocessors.
ITC405.3	Demonstrate control unit operations and conceptualize instruction level parallelism.
ITC405.4	List and Identify integers and real numbers and perform computer arithmetic operations on integers.
ITC405.5	Categorize memory organization and explain the function of each element of a memory hierarchy.
ITC405.6	Examine different methods for computer I/O mechanism.
Subject Name : NETWORKING LAB	
Subject Code : ITL401	
After the completion of the course the student should be able to	
Lab Code	**Lab Outcomes**
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	Analyze the contents the packet contents of different protocols.
ITL401.5	Implement the socket programming for client server architecture.

ITL401.6	. Design and setup a organization network using packet tracer.
Subject Name : UNIX LAB	
Subject Code : ITL 402	
After the completion of the course the student should be able to	
Lab Code	**Lab Outcomes**
ITL402.1	Identify the basic Unix general purpose commands.
ITL402.2	Apply and change the ownership and file permissions using advance Unix commands.
ITL402.3	Use the awk, grep, perl scripts.
ITL402.4	Implement shell scripts and sed.
ITL402.5	Apply basic of administrative task.
ITL402.6	Apply networking Unix commands.
Subject Name : MICROPROCESSOR PROGRAMMING LAB	
Subject Code : ITL 403	
After the completion of the course the student should be able to	
Lab Code	**Lab Outcomes**
ITL403.1	Apply the fundamentals of assembly level programming of microprocessors.
ITL403.2	Build a program on a microprocessor using arithmetic & logical instruction set of 8086.
ITL403.3	Develop the assembly level programming using 8086 loop instruction set.
ITL403.4	Write programs based on string and procedure for 8086 microprocessor.
ITL403.5	Analyze abstract problems and apply a combination of hardware and software to address the problem

ITL403.6	Make use of standard test and measurement equipment to evaluate digital interfaces.
Subject Name : PYTHON LAB	
Subject Code : ITL404	
After the completion of the course the student should be able to	
Lab Code	**Lab Outcomes**
ITL404.1	Describe the Numbers, Math functions, Strings, List, Tuples and Dictionaries in Python
ITL404.2	Express different Decision Making statements and Functions
ITL404.3	Interpret Object oriented programming in Python
ITL404.4	Understand and summarize different File handling operations
ITL404.5	Explain how to design GUI Applications in Python and evaluate different database operations
ITL404.6	Design and develop Client Server network applications using Python
Subject Name : Mini Project – 1 B for Python based automation projects	
Subject Code : ITM401	
After the completion of the course the student should be able to	
Lab Code	**Lab Outcomes**
ITM401.1	Identify problems based on societal /research needs.
ITM401.2	Apply Knowledge and skill to solve societal problems in a group.
ITM401.3	Develop interpersonal skills to work as member of a group or leader.
ITM401.4	Draw the proper inferences from available results through theoretical/ experimental/simulations.
ITM401.5	Analyse the impact of solutions in societal and environmental context for sustainable development.

ITM401.6	Use standard norms of engineering practices
ITM401.7	Excel in written and oral communication.
ITM401.8	Demonstrate capabilities of self-learning in a group, which leads to life long learning.
ITM401.9	. Demonstrate project management principles during project work.
Subject Name : Microcontroller and Embedded Programming	
Subject Code : ITC501	
Course Code :ITC501	
	After the completion of the course the student should be able to
Course Code	**Course Outcomes**
ITC501.1	Explain the embedded system concepts and architecture of embedded systems
ITC501.2	Describe the architecture of 8051 microcontroller and write embedded program for 8051 microcontroller.
ITC501.3	Design the interfacing for 8051 microcontroller.
ITC501.4	Understand the concepts of ARM architecture.
ITC501.5	Demonstrate the open source RTOS and solve the design issues for the same.
ITC501.6	Select elements for an embedded systems tool.
Subject Name : Internet Programming	
Subject Code : ITC502	
Course Code :ITC502	
	After the completion of the course the student should be able to
Course Code	**Course Outcomes**

ITC502.1	Implement interactive web page(s) using HTML,CSS and JavaScript.
ITC502.2	Design a responsive web site using HTML5 and CSS3.
ITC502.3	Demonstrate Rich Internet Application .
ITC502.4	Build Dynamic web site using server side PHP Programming and Database connectivity.
ITC502.5	Describe and differentiate different Web Extensions and Web Services.
ITC502.6	Demonstrate web application using Python web Framework-Django
Subject Name : Advanced Data Management Technology	
Subject Code : ITC503	
Course Code :ITC503	
	After the completion of the course the student should be able to
Course Code	**Course Outcomes**
ITC503.1	Explain and understand the concept of a transaction and how ACID properties are maintained when concurrent transaction occur in a database
ITC503.2	Measure query costs and design alternate efficient paths for query execution.
ITC503.3	Apply sophisticated access protocols to control access to the database.
ITC503.4	Implement alternate models like Distributed databases and Design applications using advanced models like mobile, spatial databases.
ITC503.5	Organize strategic data in an enterprise and build a data Warehouse.
ITC503.6	Analyze data using OLAP operations so as to take strategic decisions.

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Subject Name : Cryptography & Network Security	
Subject Code : ITC504	
Course Code :ITC504	
	After the completion of the course the student should be able to
Course Code	**Course Outcomes**
ITC504.1	Identify information security goals, classical encryption techniques and acquire fundamental knowledge on the concepts of finite fields and number theory.
ITC504.2	Compare different encryption and decryption techniques to solve problems related to confidentiality and authentication
ITC504.3	Apply the knowledge of cryptographic checksums and evaluate the performance of different message digest algorithms for verifying the integrity of varying message sizes
ITC504.4	Apply different digital signature algorithms to achieve authentication and create secure applications
ITC504.5	Apply network security basics, analyze different attacks on networks and evaluate the performance of firewalls and security protocols like SSL, IPSec, and PGP.
ITC504.6	Apply the knowledge of cryptographic utilities and authentication mechanisms to design secure applications
Subject Name : Business Communication & Ethics	
Subject Code : ITL505	
Course Code :ITL505	
	After the completion of the course the student should be able to
Course Code	**Course Outcomes**
ITL505.1	Design a technical document using precise language, suitable vocabulary and apt style.
ITL505.2	Develop the life skills/ interpersonal skills to progress professionally by building stronger relationships.
ITL505.3	Demonstrate awareness of contemporary issues knowledge of professional and ethical responsibilities.
ITL505.4	Apply the traits of a suitable candidate for a job/higher education, upon being trained in the techniques of holding a group discussion, facing interviews and writing

	resume/SOP.
ITL505.5	Deliver formal presentations effectively implementing the verbal and non-verbal skills.
Subject Name : Advanced Data Structures & Analysis of Algorithms	
Subject Code : ITDLO50 11	
Course Code :ITDLO50 11	
	After the completion of the course the student should be able to
Course Code	**Course Outcomes**
ITDLO50 11.1	Students will be able to choose appropriate advanced data structure for given problem.
ITDLO50 11.2	Students will be able to calculate complexity.
ITDLO50 11.3	Students will be able to select appropriate design techniques to solve real world problems.
ITDLO50 11.4	Students will able to apply the dynamic programming technique to solve the problems.
ITDLO50 11.5	Students will be able to apply the greedy programming technique to solve the problems.
ITDLO50 11.6	Students will be able to select a proper pattern matching algorithm for given problem.
Subject Name : E-commerce and E-Business	
Subject Code : ITDLO5013	
Course Code :ITDLO5013	
After the completion of the course the student should be able to	
Course Code	**Course Outcomes**
	Define and differentiate various types of E-commerce.
ITDLO5013.2	Describe Hardware and Software Technologies for E-commerce.

ITDLO5013.3	Explain payment systems for E -commerce.
ITDLO5013.4	Describe the process of Selling and Marketing on web.
ITDLO5013.5	Define and Describe E-business and its Models.
ITDLO5013.6	Discuss various E-business Strategies
Lab Outcomes : ITL 501 Internet Programming Lab	
Lab Code :ITL 501	
After the completion of the course the student should be able to	
Lab Code	**Course Outcomes**
ITL 501.1	Design a basic web site using HTML5 and CSS3 to demonstrate responsive web design.
ITL 501.2	Implement dynamic web pages with validation using JavaScript objects by applying different event handling mechanism.
ITL 501.3	Use AJAX Programming Technique to develop RIA
ITL 501.4	Develop simple web application using server side PHP programing and Database Connectivity using MySQL.
ITL 501.5	Build well-formed XML Document and implement Web Service using Java.
ITL 501.6	Demonstrate simple web application using Python Django Framework.
Lab Outcomes : ITL 502 Security Lab	
Lab Code : ITL 502	
	After the completion of the course the student should be able to
Lab Code	**Course Outcomes**
ITL 502.1	Apply the knowledge of symmetric cryptography to implement simple ciphers
ITL 502.2	Analyze and implement public key algorithms like RSA and El Gamal

ITL 502.3	Analyze and evaluate performance of hashing algorithms
ITL 502.4	Explore the different network reconnaissance tools to gather information about networks
ITL 502.5	Use tools like sniffers, port scanners and other related tools for analyzing packets in a network.
ITL 502.6	Apply and set up firewalls and intrusion detection systems using open source technologies and to explore email sec
Lab Outcomes : ITL 503 OLAP LAB	
Lab Code : ITL 503	
	After the completion of the course the student should be able to
Lab Code	**Course Outcomes**
ITL 503.1	Implement simple query optimizers and design alternate efficient paths for query execution.
ITL 503.2	Simulate the working of concurrency protocols, recovery mechanisms in a database
ITL 503.3	Design applications using advanced models like mobile, spatial databases.
ITL 503.4	Implement a distributed database and understand its query processing and transaction processing mechanisms
ITL 503.5	Build a data warehouse
ITL 503.6	Analyze data using OLAP operations so as to take strategic decisions.
Lab Outcomes : IOT Mini Project	
	After the completion of the course the student should be able to
Lab Code	**Course Outcomes**
ITL 504.1	Identify the requirements for the real world problems.
ITL 504.2	Conduct a survey of several available literatures in the preferred field of study.
ITL 504.3	Study and enhance software/ hardware skills.

ITL 504.4	Demonstrate and build the project successfully by hardware requirements, coding, emulating and testing.
ITL 504.5	To report and present the findings of the study conducted in the preferred domain
ITL 504.6	Demonstrate an ability to work in teams and manage the conduct of the research study.
Course Outcomes : Advanced Data Structures & Analysis of Algorithms: ITDLO50 11	
Lab Code : ITDLO50 11	
	After the completion of the course the student should be able to
Lab Code	**Course Outcomes**
ITDLO50 11.1	Students will be able to choose appropriate advanced data structure for given problem.
ITDLO50 11.2	Students will be able to calculate complexity.
ITDLO50 11.3	Students will be able to select appropriate design techniques to solve real world problems.
ITDLO50 11.4	Students will able to apply the dynamic programming technique to solve the problems.
ITDLO50 11.5	Students will be able to apply the greedy programming technique to solve the problems.
ITDLO50 11.6	Students will be able to select a proper pattern matching algorithm for given problem.
Subject Name : Software Engineering with Project Management	
Subject Code : ITC601	
Course Code :ITC601	
After the completion of the course the student should be able to	
Course Code	**Course Outcomes**
ITC601.1	Understand software application domains and different process model used in software development.
ITC601.2	Understand different types of software requirements, specifications and their gathering techniques.

ITC601.3	Design software model as per requirements using user interface design principles.
ITC601.4	Analyze different testing strategies and tactics, SCM and SQA.
ITC601.5	Evaluate importance of SDLC in software project development and PLC.
ITC601.6	Design different type of projects using concepts of project scheduling and risk management.
Subject Name : Data Mining and Business Intelligence	
Subject Code : ITC602	
Course Code :ITC602	
After the completion of the course the student should be able to	
Course Code	**Course Outcomes**
ITC602.1	Demonstrate an understanding of the importance of data mining and the principles of business intelligence
ITC602.2	Organize and Prepare the data needed for data mining using pre preprocessing techniques
ITC602.3	Perform exploratory analysis of the data to be used for mining.
ITC602.4	Implement the appropriate data mining methods like classification, clustering or Frequent Pattern mining on large data sets.
ITC602.5	Define and apply metrics to measure the performance of various data mining algorithms.
ITC602.6	Apply BI to solve practical problems : Analyze the problem domain, use the data collected in enterprise apply the appropriate data mining technique, interpret and visualize the results and provide decision support.

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Subject Name :Cloud Computing & Services	
Subject Code : ITC603	
Course Code :ITC603	
After the completion of the course the student should be able to	
Course Code	**Course Outcomes**
ITC603.1	Understand basic concept of cloud computing, different cloud services, deployment models & mobile cloud computing.
ITC603.2	Describe importance of virtualization along with their technologies.
ITC603.3	Examine and use different cloud computing services.
ITC603.4	Analyze the components of open stack & Google cloud platform.
ITC603.5	Describe the key components of Amazon Web Services.
ITC603.6	Use backup strategies for cloud data base on features.
Subject Name :Wireless Network	
Subject Code : ITC604	
Course Code :ITC604	
After the completion of the course the student should be able to	
Course Code	**Course Outcomes**
ITC604.1	Explain the basic concepts of wireless network and wireless generations.
ITC604.2	Demonstrate the different wireless technologies such as CDMA, GSM, GPRS etc
ITC604.3	Appraise the importance of Ad-hoc networks such as MANET and VANET and Wireless Sensor networks
ITC604.4	Describe and judge the emerging wireless technologies standards such as WLL, WLAN, WPAN, WMAN.

ITC604.5	Explain the design considerations for deploying the wireless network infrastructure.
ITC604.6	Differentiate and support the security measures, standards. Services and layer wise security considerations.
Subject Name :Digital Forensic	
Subject Code : ITDLO6023	
Course Code :ITDLO6023	
After the completion of the course the student should be able to	
Course Code	**Course Outcomes**
ITDLO6023.1	Define the concept of ethical hacking and its associated applications in Information Communication Technology (ICT) world.
ITDLO6023.2	Understand the need of digital forensic and role of digital evidences .
ITDLO6023.3	Explain the methodology of incident response and various security issues in ICT world, and identify digital forensic tools for data collection .
ITDLO6023.4	Recognize the importance of digital forensic duplication and various tools for analysis to achieve adequate perspectives of digital forensic investigation in various applications /devices like Windows/Unix system.
ITDLO6023.5	Apply the knowledge of IDS to secure network and performing router and network analysis
ITDLO6023.6	Understand the method to generate legal evidence and supporting investigation reports and will also be able to use various digital forensic tools .
Subject Name :SOFTWARE DESIGN LAB	
Subject Code : ITL601	
Course Code : ITL601	
After the completion of the course the student should be able to	
Lab Code	**Lab Outcomes**
ITL 601 .1	Sketch a Modeling with UML.
ITL 601 .2	Deploy Structural Modeling.

ITL 601 .3	Deploy Behavioral Modeling.
ITL 601 .4	Deploy Architectural Modeling.
ITL 601 .5	Examine estimation about schedule and cost for project development.
ITL 601 .6	Select project development tool.
Subject Name : BUSINESS INTELLIGENCE LAB	
Subject Code : ITL602	
Course Code : ITL602	
After the completion of the course the student should be able to	
Lab Code	**Lab Outcomes**
ITL602.1	Identify sources of Data for mining and perform data exploration
ITL602.2	Organize and prepare the data needed for data mining algorithms in terms of attributes and class inputs, training, validating, and testing files.
ITL602.3	Implement the appropriate data mining methods like classification, clustering or association mining on large data sets using open source tools like WEKA
ITL602.4	Implement various data mining algorithms from scratch using languages like Python/ Java etc.
ITL602.5	Evaluate and compare performance of some available BI packages
Subject Name : CLOUD SERVICE DESIGN LAB	
Subject Code : ITL603	
Course Code : ITL603	
After the completion of the course the student should be able to	
Lab Code	**Lab Outcomes**
ITL603.1	Define & implement Virtualization using different types of Hypervisors

ITL603.2	Describe steps to perform on demand Application delivery using Ulteo .
ITL603.3	Examine the installation and configuration of Open stack cloud
ITL603.4	Analyze and understand the functioning of different components involved in Amazon web services cloud platform.
ITL603.5	Describe the functioning of Platform as a Service
ITL603.6	Design & Synthesize Storage as a service using own Cloud
Subject Name : SENSOR NETWORK LAB	
Subject Code : ITL604	
Course Code : ITL604	
After the completion of the course the student should be able to	
Lab Code	**Lab Outcomes**
ITL604.1	Identify the requirements for the real world problems.
ITL604.2	Conduct a survey of several available literatures in the preferred field of study.
ITL604.3	Study and enhance software/ hardware skills.
ITL604.4	Demonstrate and build the project successfully by hardware/sensor requirements, coding, emulating and testing.
ITL604.5	To report and present the findings of the study conducted in the preferred domain
ITL604.6	Demonstrate an ability to work in teams and manage the conduct of the research study.

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Subject Name : MINI PROJECT	
Subject Code : IT605	
Course Code : IT605	
After the completion of the course the student should be able to	
Lab Code	**Lab Outcomes**
IT605.1	Discover potential research areas in the field of IT
IT605.2	Conduct a survey of several available literature in the preferred field of study
IT605.3	Compare and contrast the several existing solutions for research challenge
IT605.4	Demonstrate an ability to work in teams and manage the conduct of the research study.
IT605.5	Formulate and propose a plan for creating a solution for the research plan identified
IT605.6	To report and present the findings of the study conducted in the preferred domain
Subject Name : Enterprise Network Design	
Subject Code : ITC701	
Course Code :ITC701	
	After the completion of the course the student should be able to
Course Code	**Course Outcomes**
ITC701.1	Understand the customer requirements and Apply a Methodology to Network Design
ITC701.2	Structure and Modularize the Network
ITC701.3	Design Basic Campus and Data Center Network.
ITC701.4	Design Remote Connectivity

ITC701.5	Design IP Addressing and Select suitable Routing Protocols for the Network
ITC701.6	Compare Open flow controllers and switches with other enterprise networks.
Subject Name : Infrastructure Security	
Subject Code : ITC702	
Course Code :ITC702	
	After the completion of the course the student should be able to
Course Code	**Course Outcomes**
ITC702.1	Understand the concept of vulnerabilities, attacks and protection mechanisms.
ITC702.2	Analyze the software vulnerabilities and attacks on databases and operating systems.
ITC702.3	Understand the need for security protocols in the context of wireless communication.
ITC702.4	Understand the various security solutions for Web and Cloud infrastructure.
ITC702.5	Understand the different attacks on Open Web Applications and Web services.
ITC702.6	Design appropriate security policies to protect infrastructure components.
Subject Name : Artificial Intelligence	
Subject Code : ITC703	
Course Code :ITC703	
	After the completion of the course the student should be able to
Course Code	**Course Outcomes**
ITC703.1	knowledge of the building blocks of AI as presented in terms of intelligent agents.
ITC703.2	Demonstrate Analyze and formalize the problem as a state space, graph, design heuristics and select amongst different search or game based techniques to solve them.

ITC703.3	Develop intelligent algorithms for constraint satisfaction problems and also design intelligent systems for Game Playing
ITC703.4	Attain the capability to represent various real life problem domains using logic based techniques and use this to perform inference or planning.
ITC703.5	Formulate and solve problems with uncertain information using Bayesian approaches.
ITC703.6	Apply concept Natural Language processing to problems leading to understanding of cognitive computing. .
Subject Name : Mobile Application Development	
Subject Code : ITDLO7032	
Course Code :ITDLO7032	
After the completion of the course the student should be able to	
Course Code	**Course Outcomes**
ITDLO7032.1	Describe Android platform, Architecture and features.
ITDLO7032.2	Design User Interface and develop activity for Android App.
ITDLO7032.3	Use Intent , Broadcast receivers and Internet services in Android App.
ITDLO7032.4	Design and implement Database Application and Content providers.
ITDLO7032.5	Use multimedia, camera and Location based services in Android App.
ITDLO7032.6	Discuss various security issues in Android platform.

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Subject Name : Software Testing and Quality Assurance	
Subject Code : ITDLO7034	
Course Code :ITDLO7034	
After the completion of the course the student should be able to	
Course Code	**Course Outcomes**
ITDLO7034.1	Investigate the reason for bugs and analyze the principles in software testing to prevent and remove bugs.
ITDLO7034.2	Implement various test processes for quality improvement
ITDLO7034.3	Design test planning.
ITDLO7034.4	Manage the test process
ITDLO7034.5	Apply the software testing techniques in commercial environment
ITDLO7034.6	Use practical knowledge of a variety of ways to test software and an understanding of some of the trade-offs between testing techniques
Subject Name : Network Design Lab	
Subject Code : ITL 701	
Course Code : ITL 701	
After the completion of the course the student should be able to	
Lab Code	**Lab Outcomes**
ITL 701.1	Understand the requirements of an enterprise and outline its major design areas
ITL 701.2	Identify functional areas to construct high level modules for enterprise architecture and analyze them.
ITL 701.3	Identify the networking devices, prepare a bill of materials and configure the devices as per the Core, Acess and Distribution layers
ITL 701.4	Design the Server Farm for an enterprise network and discuss up gradations if needed.

ITL 701.5	Identify and select the technology for Remote site Connectivity**,** suitable IP addressing plan and routing protocol for an enterprise network.
ITL 701.6	Test and monitor the enterprise network using a tool
Subject Name : Advance Security Lab	
Subject Code : ITL 702	
Course Code : ITL 702	
After the completion of the course the student should be able to	
Lab Code	**Lab Outcomes**
ITL 702.1	Implement and analyze program and database vulnerabilities Buffer overflow and SQL Injection.
ITL 702.2	Explore and analyze different security tools to secure mobile devices, web browser, wireless network and router
ITL 702.3	Explore reconnaissance, attack and forensics tools in Kali Linux
ITL 702.4	Learn security of system using personal firewall installation
ITL 702.5	Understand AAA using RADUIS
Subject Name : Intelligence System Lab	
Subject Code : ITL 703	
Course Code : ITL 703	
After the completion of the course the student should be able to	
Lab Code	**Lab Outcomes**
ITL 703.1	Design the building blocks of an Intelligent Agent using PEAS representation .
ITL 703.2	Analyze and formalize the problem as a state space, graph, design heuristics and select amongst different search or game based techniques to solve them.
ITL 703.3	Develop intelligent algorithms for constraint satisfaction problems and also design intelligent systems for Game Playing

ITL 703.4	Attain the capability to represent various real life problem domains using logic based techniques and use this to perform inference or planning.
ITL 703.5	Formulate and solve problems with uncertain information using Bayesian approaches.
Subject Name : Android Apps Development Lab	
Subject Code : ITL 704	
Course Code : ITL 704	
After the completion of the course the student should be able to	
Lab Code	**Lab Outcomes**
ITL 704.1	Experiment on Integrated Development Environment for Android Application Development.
ITL 704.2	Design and Implement User Interfaces and Layouts of Android App.
ITL 704.3	Use Intents for activity and broadcasting data in Android App.
ITL 704.4	Design and Implement Database Application and Content Providers.
ITL 704.5	Experiment with Camera and Location Based service.
ITL 704.6	Develop Android App with Security features.
Subject Name : PROJECT -I	
Subject Code : ITM705	
Course Code : ITM705	
After the completion of the course the student should be able to	
Lab Code	**Course Outcomes**
ITM705.1	Discover potential research areas in the field of IT
ITM705.2	Conduct a survey of several available literature in the preferred field of study

ITM705.3	Compare and contrast the several existing solutions for research challenge
ITM705.4	Demonstrate an ability to work in teams and manage the conduct of the research study.
ITM705.5	Formulate and propose a plan for creating a solution for the research plan identified
ITM705.6	To report and present the findings of the study conducted in the preferred domain
Subject Name :Big Data Analytics	
Subject Code : ITC801	
Course Code : ITC801	
After the completion of the course the student should be able to	
Course Code	**Course Outcomes**
ITC801.1	Explain the motivation for big data systems and identify the main sources of Big Data in the real world.
ITC801.2	Demonstrate an ability to use frameworks like Hadoop, NOSQL to efficiently store retrieve and process Big Data for Analytics.
ITC801.3	Implement several Data Intensive tasks using the Map Reduce Paradigm
ITC801.4	Apply several newer algorithms for Clustering Classifying and finding associations in Big Data
ITC801.5	Design algorithms to analyze Big data like streams, Web Graphs and Social Media data.
ITC801.6	Design and implement successful Recommendation engines for enterprises.

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Subject Name :Internet of Everything	
Subject Code : ITC802	
Course Code : ITC802	
After the completion of the course the student should be able to	
Course Code	**Course Outcomes**
ITC802.1	Apply the concepts of IOT.
ITC802.2	Identify the different technology.
ITC802.3	Apply IOT to different applications.
ITC802.4	Analysis and evaluate protocols used in IOT.
ITC802.5	Design and develop smart city in IOT.
ITC802.6	Analysis and evaluate the data received through sensors in IOT.
Subject Name :User Interaction Design	
Subject Code : ITDLO8041	
Course Code : ITDLO8041	
	After the completion of the course the student should be able to
Course Code	**Course Outcomes**
ITDLO8041.1	Students will be able to identify and criticize bad features of interface designs.
ITDLO8041.2	Students will be able to predict good features of interface designs.
ITDLO8041.3	Students will be able to illustrate and analyze user needs and formulate user design specifications.
ITDLO8041.4	Students will be able to interpret and evaluate the data collected during the process.

ITDLO8041.5	Students will be able to evaluate designs based on theoretical frameworks and methodological approaches.
ITDLO8041.6	Students will be able to produce/show better techniques to improve the user interaction design interfaces.
Subject Name : BIG DATA LAB	
Subject Code : ITL801	
Course Code : ITL801	
	After the completion of the course the student should be able to
Course Code	**Course Outcomes**
ITL801.1	Demonstrate capability to use Big Data Frameworks like Hadoop
ITL801.2	Program applications using tools like Hive, pig, , NO SQL and MongoDB for Big data Applications
ITL801.3	Construct scalable algorithms for large Datasets using Map Reduce techniques
ITL801.4	Implement algorithms for Clustering, Classifying and finding associations in Big Data
ITL801.5	Design and implement algorithms to analyze Big data like streams, Web Graphs and Social Media data and construct recommendation systems.
ITL801.6	Apply the knowledge of Big Data gained to fully develop a BDA applications for real life applications.
Subject Name : INTERNET OF EVERYTHING LAB	
Subject Code : ITL802	
Course Code : ITL802	
	After the completion of the course the student should be able to
Course Code	**Course Outcomes**
ITL802.1	Identify the requirements for the real world problems.
ITL802.2	Conduct a survey of several available literatures in the preferred field of study.

ITL802.3	Study and enhance software/ hardware skills.
ITL802.4	Demonstrate and build the project successfully by hardware/sensor requirements, coding, emulating and testing.
ITL802.5	To report and present the findings of the study conducted in the preferred domain
ITL802.6	Demonstrate an ability to work in teams and manage the conduct of the research study.
Subject Name : DEVOPS LAB	
Subject Code : ITL803	
Course Code : ITL803	
	After the completion of the course the student should be able to
Course Code	**Course Outcomes**
ITL803.1	. Remember the importance of DevOps tools used in software development life cycle
ITL803.2	Understand the importance of Jenkins to Build, Deploy and Test Software Applications
ITL803.3	Examine the different Version Control strategies
ITL803.4	Analyze & Illustrate the Containerization of OS images and deployment of applications over Docker
ITL803.5	Summarize the importance of Software Configuration Management in DevOps
ITL803.6	Synthesize the provisioning using Chef/Puppet/Ansible or Saltstack.

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Subject Name : R-PROG. LAB	
Subject Code : ITL804	
Course Code : ITL804	
	After the completion of the course the student should be able to
Course Code	**Course Outcomes**
ITL804.1	Install and use R for simple programming tasks.
ITL804.2	Extend the functionality of R by using add-on packages
ITL804.3	Extract data from files and other sources and perform various data manipulation tasks on them.
ITL804.4	Code statistical functions in R.
ITL804.5	Use R Graphics and Tables to visualize results of various statistical operations on data .
ITL804.6	Apply the knowledge of R gained to data Analytics for real life applications.
Subject Name :PROJECT -II	
Subject Code : ITM805	
Course Code : ITM805	
	After the completion of the course the student should be able to
Course Code	**Course Outcomes**
ITM805.1	Discover potential research areas in the field of IT
ITM805.2	Conduct a survey of several available literature in the preferred field of study
ITM805.3	Compare and contrast the several existing solutions for research challenge
ITM805.4	Demonstrate an ability to work in teams and manage the conduct of the research study.
ITM805.5	Formulate and propose a plan for creating a solution for the research plan identified

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Department of Master of Management Studies

SEM I	
Course Name: Organizational Behaviour	
Course Code	**Course Statement**
CO 1	Apply concepts of Organizational Behavior in organizations
CO 2	Apply motivational theories according to personality types and group dynamics to influence perception
CO 3	Demonstrate leadership styles according to employee personality, group dynamics and organizational structure
CO 4	Analyze role of perception in group behavior during the process of organizational development
CO 5	Distinguish between employees' personalities and defense mechanisms
Course Name: creativity and innovation	
Course Code	**Course Statement**
CO 1	Compare the relationship between creativity, invention and innovation.
CO 2	Apply the concept of innovation & Creativity in Indian business environment
CO 3	Illustrate the role of managers in building new ventures and start ups through creativity & Innovation
CO 4	Analyze the Case Studies related to impacts of Management Strategies in creativity & Innovation
Course Name: Effective Team and Management Communication	
Course Code	**Course Statement**
CO 1	Evaluate components and models of communication associated with development of business communication.
CO 2	Compare Formal and Informal communication and its extraneous factors.
CO 3	Evaluate approaches and consequences of grapevine in behavioral management.
CO 4	Analyse the concepts and examples related to meetings and report writing.

CO 5	Illustrate the role of managers when dealing with people from nationalities.
Course Name: Perspective Management	
Course Code	**Course Statement**
CO 1	Evaluate organizational theories and behaviors associated with decision making.
CO 2	Compare Leadership Functions and Leadership Behavior pattern.
CO 3	Evaluate approaches and consequences of crisis management.
CO 4	Analyze the concepts and examples related to strategic management.
CO 5	llustrate the role of managers in building a network of relationships.
Course Name: Operation Management	
Course Code	**Course Statement**
CO 1	Apply the basic principles of operations management for applications in product and service industry.
CO 2	Compare the Methods of EOQ, ABC and discount policy for stock and cost implications
CO 3	Select QC and SQC technique to identify process improvement due to sources of variation
CO 4	Describe the facility layout for equipment, machines and workflow placements.
CO 5	Illustrate the knowledge of sequencing techniques in studying optimal ordering of jobs.
Course Name: Financial Accounting	
Course Code	**Course Statement**
CO 1	Apply the concepts of income statements to prepare balance sheet.
CO 2	Understand the concepts of inventory valuation and their effect on profit and cost of goods.
CO 3	Apply the concept of accounting mechanics & Process leading to preparation of Trial Balance & Financial System.
CO 4	Understand the concept of Cost Accounting

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Course Name: Managerial Economics	
Course Code	**Course Statement**
CO 1	llustrate the knowledge of types of demand and its factor affecting linear demand curve.
CO 2	Compare the pricing practices affecting pricing decisions.
CO 3	Describe the concept of supply, factors affecting supply and the law of supply for supply demand analysis.
CO 4	Illustrate the production function through isoquant and iso cost analysis to get a holistic production economy.
SEM II	
Course Name: HRM	
Course Code	**Course Statement**
CO 1	Apply Human Resource Concepts in an organization with respect to organizing personnel functions and manpower
CO 2	Implement training modules on the basis of performance appraisal and organization development strategies
CO 3	Apply concepts of change management to aid in organization development and human resource development strategies
CO 4	Analyze motivation theories to improve employee performance and retention
CO 5	Analyze Training Need during organization development
Course Name: Effective Leadership & Team Development	
Course Code	**Course Statement**
CO 1	Select the right type of team and leadership style appropriate for the situation
CO 2	Organize teams and colleagues more effectively
CO 3	Use influencing and negotiating tactics as a leader in a Team
CO 4	Apply stress and time management techniques in developing teams as a Leader
CO 5	Apply Team building and Leadership concepts in Team Management

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Course Name: Indian Ethos	
Course Code	**Course Statement**
CO 1	Apply the concepts of Indian Ethos in business
CO 2	Implement human and professional values in business decisions and everyday life
CO 3	Apply spiritual wisdom and religious commonalities in management of self and organization
CO 4	Apply relevant concepts of Leadership obtained from Historic Literature
CO 5	Implement modern day practices and Constitutional Duties in an organization
Course Name: BUSINESS Research METHODS	
Course Code	**Course Statement**
CO 1	Select Research types and designs on the basis of the research problem
CO 2	Formulate a research hypothesis for a research problem and research proposal
CO 3	Select the right questionnaire design to collect relevant data with the help of appropriate measurement and scaling
CO 4	Apply data sampling and processing on the collected primary and secondary data
CO 5	Test hypothesis with appropriate analysis techniques
CO 6	Apply appropriate structure and ethics in Research report writing
Course Name: Marketing Management	
Course Code	**Course Statement**
CO 1	Apply Marketing Management concepts for organizational Development
CO 2	Analyse Market Environment for market research and consumer buying process
CO 3	Evaluate pillars of marketing for marketing mix and new product development process
CO 4	Apply pricing decision strategies for distribution promotion and personal selling

CO 5	Implement marketing models for effective planning strategies
Course Name: Financial Management	
Course Code	**Course Statement**
CO 1	Apply the concepts of corporate finance and Indian financial system.
CO 2	Describe dividend policy and its impact on dividend payout ratio and retention ratio.
CO 3	Apply the concept of Financial Planning & Forecasting
CO 4	Apply the concept of Capital Structure Planning & Leverage Analysis
Course Name: Operation Research	
Course Code	**Course Statement**
CO 1	Illustrate the knowledge of game theory and its usage in competitive business environment.
CO 2	Compare the linear programming formulation affecting data envelopment analysis.
CO 3	Describe the concept of transportation problems affecting project management.
CO 4	Evaluate effects of project management techniques under risk and uncertainty.
Course Name: Entrepreneurship Management	
Course Code	**Course Statement**
CO 1	Evaluate Legal framework for starting a business in India
CO 2	Compare Indian family business with international entrepreneurship
CO 3	Analyze the concepts and examples related to entrepreneur and entrepreneurship.
CO 4	Illustrate the role of managers in building new ventures and start ups.
CO 5	Describe PEST factors and its application in the start up business model.

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SEM III – HR	
Course Name: Compensation & Benefits	
Course Code	**Course Statement**
CO 1	Apply concepts of reward strategies in an organization
CO 2	Analyze components of a compensation of an employee in an organization
CO 3	Design an effective compensation structure of an employee based on reward strategies and inflation
CO 4	Analyze data collected from market research and remuneration survey for a salary proposal
CO 5	Identify intrinsic and extrinsic benefits to be given to employees as part of compensation
CO 6	Apply tax laws in the compensation structures of employees in an organization
Course Name: Competency Based HRM and Performance Management	
Course Code	**Course Statement**
CO 1	Compare the application of performance appraisal systems in terms of employee development
CO 2	Evaluate the role of appraiser in conducting staff appraisal
CO 3	Analyze the concepts of validating competency models
CO 4	Analyze the role of Human Resource Management in building ethical performance management practices
CO 5	Analyze cases of multinational corporations' pitfalls and limitation
Course Name: Global HRM	
Course Code	**Course Statement**
CO 1	Apply concepts of Human Resource Management in Domestic and International Workforce
CO 2	Analyze International Human Resource Practices for Effective International Workforce Management
CO 3	Implement emerging employee relation trends in the organization

CO 4	Analyze the legal framework involved in International Human Resource Management
CO 5	Apply International Recruiting and Training methods while managing International Workforce Management
Course Name: Human Resource Planning and Application of Technology in HR	
Course Code	**Course Statement**
CO 1	Compare the concepts of Selection and job analysis for a profile for the recruitment process
CO 2	Identify appropriate methods for job analysis for effective hiring
CO 3	Organize diversity in a work force for effective implementation of strategies
CO 4	Illustrate the knowledge of technology in human resource management, in relation to recruitment, payroll and forecasting
Course Name: Training & Development	
Course Code	**Course Statement**
CO 1	Evaluate the concepts of training, structure, need assessment and training evaluation.
CO 2	Compare major learning methodologies and principles of Adult Learning.
CO 3	Evaluate training budget, calendar and training modules.
CO 4	Analyze the concepts and examples related to satellite Based Training, Outbound Training and fusion methodology.
CO 5	Illustrate the role of managers in methods of planning, organizing conferences and training audit.
CO 6	Analyze the Case Studies related to competency modeling and mapping.
Course Name: Labour Law	
Course Code	**Course Statement**
CO 1	Apply system approach to IR and IR Model relating to labour laws for industrial purpose
CO 2	Apply Industrial Dispute Act and Trade Union Act for amendments and provisions for industrial functioning
CO 3	Apply Social Security Legislations and Wage Legislations for fair wage practices

CO 4	Evaluate theory of Maternity Benefit Act and Apprentice Act for employee benefit
CO 5	Apply Factories Act and Bombay Shop and Establishment Act for welfare of workers and shop owners..
Course Name: International Business(Common Subject For All Specialization)	
Course Code	**Course Statement**
CO 1	Evaluate cross cultural management and the cultural differences
CO 2	Compare EPRG Model and Country Analysis.
CO 3	Evaluate appropriate approaches and consequences of culture and leader effectiveness.
CO 4	Analyze the concepts and examples related to investment decisions.
CO 5	Illustrate the impact of I-R model on subsidiary management.
Course Name: Strategic Management (Common Subject)	
Course Code	**Course Statement**
CO 1	Illustrate the use of PESTEL and SWOT as tools for strategic formulation.
CO 2	Compare the relationship between Ansoff matrix and grand strategy for strategic formulation.
CO 3	Describe Porter's Generic strategies and Value chain
CO 4	Illustrate SBU and McKinsey models for strategic coherence.
CO 5	Demonstrate the Red-Blue-Purple Ocean strategy
SEM III – Finance	
Course Name: Financial Markets and Institutions	
Course Code	**Course Statement**
CO 1	Apply the concepts of spot rates and forward rates to measure risk of fixed income securities.
CO 2	Critically evaluate the historical development of regulations and supervision of financial markets for both bank based and market based systems

CO 3	To understand different components of the Indian Financial system and their functions.
CO 4	Apply different company valuation techniques to determine share prices
CO 5	Students will have critical thinking and problem solving skills applicable to business and management practice or issues
Course Name: Corporate Valuation and Mergers & Acquisitions	
Course Code	**Course Statement**
CO 1	Illustrate the process of valuation for judicial & Regulatory people
CO 2	Compare financial statement from valuation perspective
CO 3	Examine discounted approach to valuation & Evaluate noc DCF valuation model for business restructuring strategies in a company
CO 4	Applying pricing application in valuation
Course Name: Security Analysis and Portfolio Management	
Course Code	**Course Statement**
CO 1	Analyze types of securities for risk calculation
CO 2	Apply efficiency market hypothesis for price calculation & Equity research
CO 3	Apply indexing & Benchmarking for tracking in index
CO 4	Analyzing capital asset pricing model & Portfolio risk management
CO 5	Apply Factor model & Arbitrage pricing theory for valuation
Course Name: Financial Regulations	
Course Code	**Course Statement**
CO 1	Analyzing Need & Significance Of Indian financial system & Regulation
CO 2	Analyzing the framework of various financial regulatory & Statutory bodies like Sebi &RBI
CO 3	Applying IRDA &CCI Regulatory framework in Financial System

CO 4	Evaluate FEMA For account Transaction & Evaluate money laundering concept
CO 5	Analyze Regulatory framework in Commodity market
Course Name: Derivatives and Risk Management	
Course Code	**Course Statement**
CO 1	Evaluate components of Bull call spread, Bear put spread, Ladder and Ladder ratio spreads.
CO 2	Compare trading option for trading risk free arbitrage
CO 3	Analyze the concepts and examples related to Risk Management using Greeks Delta, Theta, Vega and Gamma risks of options.
CO 4	Illustrate risk management strategies for option volatity
CO 5	Apply the concept of derivative market for financial risk management
Course Name: Banking and Financial Services Institutions	
Course Code	**Course Statement**
CO 1	Evaluate the concepts of Fund based and Fee based services.
CO 2	Compare major banking products and services available for retail and corporate banks in India.
CO 3	Evaluate Mutual Funds Products, schemes and investment plans.
CO 4	Analyze the concepts and examples related to leasing, leasing procedure followed by Indian Financial Institutions
CO 5	Illustrate the role of managers in building direct marketing communication tools.
SEM III – System	
Course Name: Database Management System & Data Warehousing	
Course Code	**Course Statement**
CO 1	Evaluate components and models of entity relationship and entity sets.
CO 2	Compare Database Management System at Logical, Conceptual and physical system environment.

CO 3	Evaluate Data warehousing, Multidimensional Data models and data warehousing architecture.
CO 4	Analyze the concepts of Data Fragmentation, Replication and Allocation Techniques for distributed data base design
CO 5	Illustrate Simple Centralized Database System and its advantages to users.
CO 6	Analyze the Cases related to Traditional file System and Modern Data base management system.
Course Name: Enterprise Management Systems	
Course Code	**Course Statement**
CO 1	Evaluate Merits and Demerits Enterprise Resource Planning.
CO 2	Compare application Areas of ERP in SCM and CRM.
CO 3	Evaluate industry verticals and impact of ERP on the verticals.
CO 4	Analyze the concepts and examples related to enterprise content management.
CO 5	Illustrate the role of IT and Systems building cashless and process oriented organizations.
Course Name: Big Data and Business Analytics	
Course Code	**Course Statement**
CO 1	Apply the concepts of ELT Data processing chain from business intelligence to business analytics.
CO 2	Analyzing Data Mining and decision making predictive analysis forecasting.
CO 3	Evaluate theory of NLP, Regression, Correlation and cluster analysis for data driven prediction.
CO 4	Analyze informative Cognos and integration social analytics for business application.
Course Name: Knowledge Management	
Course Code	**Course Statement**
CO 1	Illustrate the knowledge and expertise meaning of epistemology.
CO 2	Compare Procedural Vs Declarative, Tactic Vs Explicit generals.

CO 3	Analyzing concept of environment forces driving KM organizational issues in KM Systems.
CO 4	Illustrate factors influencing universalistic and contingency view leadership.
Course Name: Software Engineering	
Course Code	**Course Statement**
CO 1	Compare the phases of software development life cycle model.
CO 2	Analyze use of structured methods for visualization of the IT based solution.
CO 3	Analyze software estimation and methods of software estimation.
CO 4	Illustrate the knowledge of documenting software development process for user requirement specifications.
CO 5	Apply functional testing, automated methods for testing and stress test for quality assurance in each phase.
Course Name: Data Mining and Business Intelligence	
Course Code	**Course Statement**
CO 1	Evaluate Architecture of Data Mining and its functionalities.
CO 2	Compare data mining techniques and its statistical perspective.
CO 3	Evaluate role of business intelligence in modern business and its challenges.
CO 4	Analyze the Enterprise Performance Life Cycle framework elements implemented in BI.
CO 5	Analyze the Case Studies related to industry approaches and trends towards data mining.
	SEM III – Operation
Course Name: Manufacturing Resource Planning and Control	
Course Code	**Course Statement**
CO 1	Compare the MRP1 and MRPII benefits use in decision making
CO 2	Analyze criteria for good capacity requirement planning and scheduling strategies

CO 3	Apply MRPC models optimization for capacity planning models lay out
CO 4	Illustrate the knowledge of broader heading ,safety and hedges on MPS module
CO 5	Analyze independent and dependent demand for quantitative problems
Course Name: Material Management	
Course Code	**Course Statement**
CO 1	Apply the material management concepts for material planning and purchase
CO 2	Analyze criteria for Supplier Quality Assurance programme for International procurement-Imports
CO 3	Identify Types of inventories of stores and benefits of scientific storekeeping models for capacity planning
CO 4	Illustrate the knowledge of codification for standardization
CO 5	Analyze Obsolete, Surplus and Scrap management for stock verification and material handling ethically"
Course Name: Operation Analytics	
Course Code	**Course Statement**
CO 1	Apply the concepts of MAD, MSE, MAPE & tracking signal.
CO 2	Analyze risk and performance indices with respect to cost, capacity, quality logistics and distribution.
CO 3	Apply supply chain analytics and its impact on Procurement, Manufacturing.
CO 4	Evaluate reporting, drill down, utility view and process view.
CO 5	Analyze performance metrics for inventory decision for dashboard design and scorecard design
Course Name: Service Operation Management	
Course Code	**Course Statement**
CO 1	Compare the benefits of service operation management for service delivery and site selection
CO 2	Analyze demand sensitive services for Integer Programming and Location Selection

CO 3	Identify profitability in service industry through yield management technique
CO 4	Illustrate inventory management techniques for outsourcing and offshoring
CO 5	Analyze Performance measurement of Service Operations for cost and productivity measures
Course Name: Chain Management	
Course Code	**Course Statement**
CO 1	Compare the benefits of resource planning procedures for decision making.
CO 2	Analyze criteria for capacity requirement planning and scheduling strategies.
CO 3	Identify models optimization for capacity planning models lay out.
CO 4	Illustrate the knowledge of Broader heading, safety and hedges on MPS module.
CO 5	Analyze independent & dependent demand for quantitative problems.
Course Name: Industrial Engineering Applications & Management	
Course Code	**Course Statement**
CO 1	Evaluate industrial engineering scope and productivity.
CO 2	Compare ILO framework for industrial engineering standards
CO 3	Evaluate different approaches and consequences of work study measurement.
CO 4	Analyze the concepts and examples related to white collar productivity.
CO 5	Illustrate the role of managers in building P,Q,R,S,T concepts.
SEM III – Marketing	
Course Name: Digital Marketing	
Course Code	**Course Statement**
CO 1	Apply concepts of marketing on a digital platform

CO 2	Analyze consumer behavior on the basis of analytical reports generated in Search Engine Optimization and AdWords Campaign
CO 3	Design Social Media and Search Engine Marketing campaign strategies to improve company digital visibility
CO 4	Apply relevant pricing models based on campaign analytics
CO 5	Apply knowledge of social media, email and mobile marketing in e-Commerce
Course Name: Consumer Behaviour	
Course Code	**Course Statement**
CO 1	Evaluate motivational theories to encourage consumer decision making process
CO 2	Analyze consumer psychology and attitude towards marketing strategies
CO 3	Evaluate purchase and group behavior based on social class in current digital evolution
CO 4	Analyze organizational buying process with respect to emerging cultural trends in Indian Market
Course Name: Services Marketing	
Course Code	**Course Statement**
CO 1	Compare the demand sensitive services for developing quantitative ability for decision making.
CO 2	Apply the concept of Complaint handling, Service Failure & Service Recovery.
CO 3	Illustrate SERVQUAL model in various business scenarios.
CO 4	Classify the types of Consumer Behaviour in Services and the reciprocating strategies.
Course Name: Sales Management	
Course Code	**Course Statement**
CO 1	Apply Sales Management concept in any business organization
CO 2	Apply selling skills; Negotiation skills for services sales against physical goods sales
CO 3	Evaluate approaches and consequences of territory management and route planning.

CO 4	Analyze the concepts and examples related to forecasting techniques and trend analysis.
CO 5	Analyze the role of sales managers in field's sales control and sales management.
Course Name: Marketing Strategy	
Course Code	**Course Statement**
CO 1	Apply Market intelligence for market research and investment
CO 2	Evaluate product and brand policy aligning with organization culture
CO 3	Apply pricing strategies for product promotion
CO 4	Evaluate Market Plan for channel selection strategy
Course Name: Product and Brand Management	
Course Code	**Course Statement**
CO 1	Evaluate Product Mix and Strategic Business Unit Strategies in multifactor mix
CO 2	Evaluate Branded House Vs House of Brands and Corporate Brand
CO 3	Evaluate approaches and consequences of Brand prism by Kapferer Model in Brand Anatomy
CO 4	Analyse the concepts and examples of Brand Equity.
CO 5	Illustrate the role of managers in building Product and brand concepts.
Course Name: International Business(Common Subject For All Specialization)	
Course Code	**Course Statement**
CO 1	Evaluate cross cultural management and the cultural differences
CO 2	Compare EPRG Model and Country Analysis.
CO 3	Evaluate appropriate approaches and consequences of culture and leader effectiveness.
CO 4	Analyze the concepts and examples related to investment decisions.

CO 5	Illustrate the impact of I-R model on subsidiary management.
SEM IV	
Course Name: HR - OD and Change Management	
Course Code	**Course Statement**
CO 1	Apply the concepts of Creativity and Innovation in organizational change and development
CO 2	Analyze performance management and organizational culture during organizational diagnosis
CO 3	Apply theories and Techniques of intervention during organizational development
CO 4	Implement appropriate steps to monitor change and reduce resistance during change in organization
CO 5	Analyze Latest Trends of the market to incorporate in the organizational culture and its internal environment
Course Name: Finance - Commercial Banking	
Course Code	**Course Statement**
CO 1	Applying the concept of commercial banking & dangers of money laundering
CO 2	Illustrate the knowledge of term loan and working capital , treasury operation and how to appraise a credit proposal.
CO 3	Illustrate the knowledge of Legal Aspects of Banking, Negotiable Instrument Act, Retail banking and Banking Regulation Act.
CO 4	Demonstrate the India's agrarian sector and regional rural banks priority sector .
Course Name: Marketing - Trends in Marketing	
Course Code	**Course Statement**
CO 1	Analyze trends in marketing while keeping development goals in mind
CO 2	Apply appropriate strategies when marketing for targeted income level
CO 3	Use recent market trends in Pricing, Promotion, Positioning, Data Analysis and Communication
CO 4	Analyze global marketing trends in marketing of recent trending products

CO 5	Design marketing strategies using data of customer experience and expectation
CO 6	Develop strategies with Marketing 4.0 and appropriate intelligence and counter intelligence measures
Course Name: Strategic Information Technology Management	
Course Code	**Course Statement**
CO 1	Apply the concepts related to value chain, five forces, Information asymmetry and Technology.
CO 2	Apply Strategic Role of IT in gaining Competitive advantage.
CO 3	Analyze different methods of Web related technologies, web media to use world wide web for business.
CO 4	Illustrate the knowledge of Mobile technology and impact on business and mobile strategy
CO 5	Apply the concepts of Writing own strategy- Develop.
Course Name: Operations Outsourcing and Off shoring	
Course Code	**Course Statement**
CO 1	Understand the basic principles of risks pertaining to Outsourcing & mitigation of risks .
CO 2	Compare Off shoring Cost Issues and Off shoring Non Cost Issues .
CO 3	Apply Factors driving Outsourcing and Scale of production or service.
CO 4	Analyze the Unethical and Ethical issues facing the Off shoring.
CO 5	Illustrate the knowledge of trade dispute and international disputes in off shoring.
Course Name: Project Management (UA) (Common Subject)	
Course Code	**Course Statement**
CO 1	Evaluate Project Management Concepts and attributes of Project lifecycle and stake holders
CO 2	Compare Average and Exponential smoothing methods with Techno-economic feasibility
CO 3	Evaluate Time and cost estimates with AON and AOA Conventions for Budget estimates .

CO 4	Analyze the concepts and examples related to project management.
CO 5	Illustrate the concept of Project scheduling and Risk Management techniques.