HALDIA INSTITUTE OF TECHNOLOGY

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

3rd SEM

Course Code : ESC 301	Course Name:**Analog and Digital Electronics**
ESC 301.1	Explain the fundamental Analog circuits such as Amplifiers, Wein Bridge Oscillator, multivibrators, Schimtt Trigger, and 555 timers.
ESC 301.2	Illustrate binary arithmetic, code conversion; and solve Boolean logic minimization.
ESC 301.3	Design the fundamental combinational and sequential logic circuits; and counters and registers.
ESC 301.4	Discuss the basic concepts of logic families and elementary A/D and D/A conversion techniques.
ESC 301.5	Improve the combinational and sequential circuit design and minimization techniques.
ESC 301.6	Formulate the circuit design theory for model development of logic circuits.

Course Code : PCC-CS301	Course Name : **Data Structure & Algorithm**
PCC-CS301.1	Define and understanding introductory concepts of data structure, time and space analysis of algorithms using different asymptotic notations.
PCC-CS301.2	Understanding linear data structures with its applications and operations on different Linked lists.
PCC-CS301.3	Illustrate the concept and implementation of stack, queue, dequeue, circular queue, and applications of stack using recursion.
PCC-CS301.4	Understanding and build non-linear data structure such as trees, its traversal, insertion, deletion, height-balanced and B-trees.
PCC-CS301.5	Analyze and evaluate various searching and sorting algorithms, problem analysis and representation of graphs such as BFS and DFS.
PCC-CS301.6	Analyze and evaluate the importance of data structure and be able to correlatefuture programming structure, and its market issues specific to complex engineering problems.

Course Code : PCC-CS302	Course Name : **Formal Language & Automata Theory**
PCC-CS302.1	Define automata theory as the basis of all computer languages and recall set, graph, tree, principle of mathematical induction.
PCC-CS302.2	Explain Finite State Machine, its behavior and how to minimize the machine.
PCC-CS302.3	Demonstrate Finite Automata, regular expression and checkequivalence between regular grammar and FA.
PCC-CS302.4	Examine context free grammar (CFG), minimize CFG and check equivalence of CFL and PDA.
PCC-CS302.5	Apply pumping lemma to disprove the language is regular language or context free language.
PCC-CS302.6	Design Turing machines for languages and realize limitations in computing.

Course Code : BSC 301	Course Name : **Mathematics III (Probability & Statistics)**
BSC 301.1	Recite concept of permutation and combination, concept of statistics.
BSC 301.2	Discuss the concept probability distribution, statistical inference and hypothesis testing.
BSC 301.3	Demonstrate computational modelling of biological phenomena and applies techniques from areas such as artificial intelligence, data base, software engineering, machine learning, image processing.
BSC 301.4	Illustrate physical scenarioand classify them to recognize the best fit physical and logical models.
BSC 301.5	Compare different mathematical results during the process of problem analysis.
BSC 301.6	Design models to demonstrate industrial problem for emerging trend in information technology.

Course Code : HSMC-301	Course Name : **Economics for Engineers (Humanities-II)**
HSMC-301.1	Make different economic decisions and estimate engineering costs by applying different cost estimation models.
HSMC-301.2	Create cash flow diagrams for different situations and use different interest formulae to solve associated problems.
HSMC-301.3	Take decisions regarding different engineering projects by using various criteria like rate of return analysis, present worth analysis, cost-benefit analysis etc.
HSMC-301.4	Incorporate the effect of uncertainty in economic analysis by using various concepts like expected value, estimates and simulation. They will also understand the process of inflation and use different price indices to adjust for its effect.
HSMC-301.5	Understand the concepts of depreciation and replacement analysis and solve associated problems.
HSMC-301.6	Apply the various concepts of Accounting like balance sheet and ratio analysis. Also they will understand the scope of Finance and the role of financial planning and management.

Course Code : ESC-391	Course Name : **Analog & Digital Electronics Lab**
ESC-391.1	Extend the knowledge to implement the basic analog and digital circuits.
ESC-391.2	Experimentwith the ICs to solve problems related to Digital logic circuits.
ESC-391.3	Design and test the combinational circuits, and code conversion methods.
ESC-391.4	Comparevarious synchronous and asynchronous sequential circuits.
ESC-391.5	Modify and minimizethe logic circuits to improve design skill-set.
ESC-391.6	Developmodels for real-life applications related to life-long learning.

Course Code : PCC-CS391	Course Name : **Data Structure & Algorithm Lab**
PCC-CS391.1	Define different operations on data structure such as insertion, deletion, merging using arrays.
PCC-CS391.2	Demonstrate implementation of stacks and queues: insertion, deletion of elements, circular queue: insertion, deletion of elements using array.
PCC-CS391.3	Solve expressions operations using multiple stacks & queues.
PCC-CS391.4	Construction and implementation of linked lists: inserting, deleting, and inverting a linked list. Analyze implementation of stacks & queues using linked lists, polynomial addition, polynomial multiplication, sparse matrices multiplication, addition using linked list.
PCC-CS391.5	Evaluate recursive and non-recursive traversal of trees and implementation of recursive binary tree traversal and AVL tree.
PCC-CS391.6	Design and implement of different searching and sorting algorithms.

Course Code : PCC-CS392	Course Name : **IT Workshop (Sci Lab/MATLAB/Python/R)**
PCC-CS392.1	To master an understanding of scripting & the contributions of scripting languages.
PCC-CS392.2	Design real life problems and think creatively about solutions.
PCC-CS392.3	To identify the usages of methods and classes to meet different scientific objectives
PCC-CS392.4	To identify the usages of plot functions to represent data in better form
PCC-CS392.5	Apply a solution in a program using R/Matlab/Python.
PCC-CS392.6	To be exposed to advanced applications of mathematics, engineering and natural sciences to program real life problems.

4th SEM

Course Code : : PCC-CS401	Course Name : **Discrete Mathematics**
PCC-CS401.1	Express a logic sentence in terms of predicates, quantifiers, and logical connectives.Upon completion of the course, the student will be able to use logical notation.
PCC-CS401.2	Derive the solution for a given problem using deductive logic and prove the solution based on logical inference.Apply recursive functions and solve recurrence relations.
PCC-CS401.3	Classify its algebraic structure for a given a mathematical problem.Describe useful standard library functions, create functions, and declare parameters.
PCC-CS401.4	Evaluate Boolean functions and simplify expressions using the properties of Boolean algebra.Design and evaluate Euler and Hamilton circuits. Able to apply algorithms to problems including searching algorithms, base conversion algorithms and the Euclidean algorithm.
PCC-CS401.5	Develop the given problem as graph networks and solve with techniques of graph theory.And calculate discrete probabilities. Students will be able to apply Recursion and advanced counting technique problem solution.
PCC-CS401.6	Use graphs and trees.Apply basic and advanced principles of counting. Simplify and evaluate basic logic statements including compound statements, implications, Inverses, converses, and contra-positives using truth tables and the properties of logic.

Course Code :PCC-CS402	Course Name : **Computer Organization & Architecture**
PCC-CS402.1	Demonstrate sufficient knowledge and understanding of data representation, and experiment with basic arithmetic operations.
PCC-CS402.2	Analyze and model various functional units of CPU such as ALU, control unit and register file.
PCC-CS402.3	Organize the memory hierarchy and design a memory of any type.
PCC-CS402.4	Explain the instruction set architecture, instruction formats and instruction cycle.
PCC-CS402.5	Outline various modes of I/O operations and summarize working principles of I/O interface circuits.
PCC-CS402.6	Explain the pipelining technique and its related issues.

Course Code : PCC-CS403	Course Name : **Object Oriented Programming**
PCC-CS403.1	Explain the principal of Object Oriented Programming (OOP) using programming syntaxes of JAVA programming language.
PCC-CS403.2	Identify the requirements to the solution of complex engineering problems by proper analysis ofclasses with their relationshipsand interpretation of data/objects.
PCC-CS403.3	Construct algorithms with computer programs to implement the major OOP concepts related to Data Encapsulation, Polymorphism, Code Reusability, Robustness, Multi-processing (Thread), etc.
PCC-CS403.4	Design different system componentslikeGraphicalUser Interfaces with

	Applet & Swing and small applications using object oriented design approach.
PCC-CS403.5	Develop OOP based applications using modern tools following the professional OOP based engineering solutions, ethics and management techniques.
PCC-CS403.6	Assess the need and utility for different OOP components and their role-play to produce huge distributed data driven software to contribute to lifelong learning.

Course Code : PCC-CS 404	Course Name : **Design and Analysis of Algorithms**
PCC-CS 404.1	For a given algorithms analyse worst-case running times of algorithms based on asymptotic analysis and justify the correctness of algorithms. And for a given model engineering problem model it using graph and write the corresponding algorithm to solve the problems.
PCC-CS 404.2	Describe the greedy paradigm and explain when an algorithmic design situation calls for it. For a given problem develop the greedy algorithms.
PCC-CS 404.3	Describe the divide-and-conquer paradigm and explain when an algorithmic design situation calls for it. Synthesize divide-and-conquer algorithms. Derive and solve recurrence relation.
PCC-CS 404.4	Describe the dynamic-programming paradigm and explain when an algorithmic design situation calls for it. Also, develop the dynamic programming algorithms, and analyze it to determine its computational complexity.
PCC-CS 404.5	Explain the ways to analyze randomized algorithms (expected running time, probability of error).
PCC-CS 404.6	Explain what an approximation algorithm is. Compute the approximation factor of an approximation algorithm (PTAS and FPTAS).

Course Code : BSC 401	Course Name : **Biology**
BSC 401.1	
BSC 401.2	
BSC 401.3	To Be updated
BSC 401.4	
BSC 401.5	
BSC 401.6	

Course Code : MC-401	Course Name : **Environmental Sciences**
MC-401.1	
MC-401.2	
MC-401.3	To Be updated
MC-401.4	
MC-401.5	
MC-401.6	

Course Code : PCC-CS492	Course Name : **Computer Organization & Architecture Lab**
PCC-CS492.1	Apply the knowledge of all basic logic gates and implement various basic logic circuits such as multiplexer, decoder, encoder and comparator. To demonstrate the results of logic and timing simulations and to use these simulation results to debug digital systems.
PCC-CS492.2	Illustrate minimization techniques to solve adder, subtractor, and composite unit and extend various logic gates to design arithmetic logic circuits.
PCC-CS492.3	Demonstrate parallel adder, CLA (Carry Look-Ahead Adder) and test CLA which is relevant to the professional engineering practice.
PCC-CS492.4	Select multiplexer unit to design composite ALU and make use of ALU for modern engineering and IT tools and estimate decoder and encoder design practice.
PCC-CS492.5	To develop skills, techniques and learn state-of-the art engineering tools (such as VHDL, Altera Max Plus II, Xilinx ISE simulator etc) to design, implement and test modern day digital systems on FPGAs.
PCC-CS492.6	To explain Xilinx Foundation tools and Hardware Description Language (VHDL). To Understand through hands-on experimentation the Xilinx tools for FPGA design as well as the basics of VHDL design and simulate digital systems.

Course Code : PCC-CS493	Course Name : **Object Oriented Programming Lab**
PCC-CS493.1	Interpret theprincipal of Object Oriented Programming (OOP) using programming syntaxes of JAVA programming language byanalyzing the problems.
PCC-CS493.2	Identify the requirements to the solution of complex engineering problems by proper analysis ofclasses with their relationshipsand interpretation of data/objects.
PCC-CS493.3	Construct computer programs to implement the major OOP concepts related to Class & Object, Polymorphism, Inheritance, Interface, Exception Handling, Multi-processing (Thread), etc using JAVA coding ethics by making use of modern tools like Notepad++, Netbeans or Eclipse IDE.
PCC-CS493.4	Develop GraphicalUser Interfaces using Applet, Swing, Layout manager, Jbutton class with action listeners, etc.
PCC-CS493.5	Build small OOP based applications working individually or in a team with proper documentations following the professional OOP based engineering solution techniques.
PCC-CS493.6	Determine the need for different OOP components hands-on to produce huge distributed data driven software from the implementation point of view to contribute to lifelong learning.

Course Code : PCC-CS 494	Course Name : **Design and Analysis of Algorithm Lab**
PCC-CS 494.1	Recall and solve asymptotic notation, Time complexity of iterative and recursive algorithm.
PCC-CS 494.2	Explain divide and conquer method to implement binary search, merge sort, quick sort.
PCC-CS 494.3	Demonstrate principal of optimality and implement chain matrix multiplication, all pair shortest path, Prim's algorithm, Kruskal's algorithm, Dijkstra algorithm to minimize output.
PCC-CS 494.4	Implement knapsack algorithm, job sequencing with deadline to maximize output.
PCC-CS 494.5	Apply backtracking method to solve n-queens and n-coloring problems.
PCC-CS 494.6	Designand Develop algorithms for different complex problems such as NP problems, and design and develop CDP, VC problem.

5th SEM

Course Code: ESC 501	Course Name:**Compiler Design**
ESC 501.1	Remember the fundamentals of Automata Theory and explain various phases of a compiler.
ESC 501.2	Analyse the roll of the lexical analyser and design token recognizer using modern tools (LEX).
ESC 501.3	Compare Top-down and Bottom-up parsing Techniques and construct parser using YACC.
ESC 501.4	Determine intermediate code and then optimize the code.
ESC 501.5	Discuss design issues of a simple code generator, register allocation and assignment.
ESC 501.5	Design and develop a simple Compiler.

Course Code: PCC- CS 501	Course Name:**Data Base Management System**
PCC- CS 501.1	Define and understand the fundamentals of Data base management System and traditional file system.
PCC- CS 501.2	Understand and explain the concepts of relational database management system.
PCC- CS 501.3	Make use ofthe tools to implement Entity Relationship diagrams.
PCC- CS 501.4	Utilize andtake part inthenormalization of the real world database to remove redundancies and able to apply the conversion of one Normal Form to Higher Normal Form.
PCC- CS 501.5	Elaborate the importance and rule on database management system concepts to minimize conflict in concurrent transactions.
PCC- CS 501.6	Discussthe importance of Database management system for storage of data in various formats and able to judge the environmental, societal and market issues specific to software development.

Course Code: PCC- CS502	Course Name:**Operating System**
PCC- CS502.1	Illustrate the resource-management by the Operating System and describe the basic principles used in the design of modern Operating Systems.
PCC- CS502.2	Apply various CPU scheduling algorithms for any given problem and outline the needs and applications of process synchronization.
PCC- CS502.3	Identify the issues in deadlock in terms of avoiding, preventing and recovering the same.
PCC- CS502.4	Elaborate the different schemes used in memory management including paging and segmentation.
PCC- CS502.5	Analyze various file and disk management strategies.
PCC- CS502.6	Justify the issues in I/O management and security.

Course Code : PCC- CS503	Course Name :**Microprocessor and Microcontroller**
PCC- CS503.1	Demonstrate architectures of 8085 and 8086 microprocessors.
PCC- CS503.2	Explain and illustrate the instruction set of 8085 microprocessor.
PCC- CS503.3	List and solve some application programs using 8085 assembler.
PCC- CS503.4	Discuss the interrupt structure of 8085 and 8086.
PCC- CS503.5	Explain 8255 PPI, 8251 USART, 8237 DMA controller and 8259 Programmable Interrupt Controller.
PCC- CS503.6	Demonstrate the basic knowledge of 8051 microcontroller.

Course Code : HSMC-501	Course Name :**Introduction to Industrial Management (Humanities III)**
HSMC-501.1	Interpret given organization structure, culture, climate and major provisions of factory acts and laws.
HSMC-501.2	Explain material requirement planning and store keeping procedure.
HSMC-501.3	Plot and analyse inventory control models and techniques.
HSMC-501.4	Prepare and analyse CPM and PERT for given activities.
HSMC-501.5	List and explain PPC functions.
HSMC-501.6	Understand the concept of Value Analysis and cost control by application of JIT and ERP

Course Code : PEC-IT 501A	Course Name :**Theory of Computation**
PEC-IT 501A.1	ExplainTo understand the concept of machines: finite automata, pushdown automata, linear bounded automata, and Turing machines.
PEC-IT 501A.2	Determine The formal languages and grammars: regular grammar and regular languages, context-free languages and context-free grammar; and introduction to context-sensitive language and context-free grammar, and unrestricted grammar and languages.
PEC-IT 501A.3	Evaluate The relation between these formal languages, grammars, and machines.
PEC-IT 501A.4	Formulate The complexity or difficulty level of problems when solved using these machines.
PEC-IT 501A.5	Develop and access The concept of algorithm.
PEC-IT 501A.6	DesignTo compare the complexity of problems.

Course Code : PEC-IT 501B	Course Name :**Artificial Intelligence**
PEC-IT 501B.1	Explain the modern tools of Artificial Intelligence (AI) and knowledge representation models.
PEC-IT 501B.2	Determine the domain-specific problems solving methods using AI based algorithms and techniques.
PEC-IT 501B.3	Evaluateknowledge based representation and learning methods for broad areas of state-of-the-art technological growth.
PEC-IT 501B.4	Formulate the solution requirements of complex engineering

	problems in multidisciplinary application fields.
PEC-IT 501B.5	Develop and access some current applications of AI in the fields of Expert Systems, Robotics, Machine Learning and others.
PEC-IT 501B.6	Design the efficient solutions using different AI based schemes, and relate with technological advancement for future learning.

Course Code : PEC-IT 501C	Course Name :**Advanced Computer Architecture**
PEC-IT 501C.1	Choose the attributes of computer architecture and elaborate the performance of a computer using various parameters.
PEC-IT 501C.2	Explain different parallel processing architectures.
PEC-IT 501C.3	Compare control flow vs. data flow, data dependencies vs. resource dependencies, RISC vs. CISC, static vs. dynamic network topologies, etc.
PEC-IT 501C.4	Demonstrate the pipelining technique and its related issues.
PEC-IT 501C.5	Discuss basic knowledge related to the vector processing, array processors and multiprocessors.
PEC-IT 501C.6	Demonstrate the data flow architecture and propose parallel programming models.

Course Code: PEC-IT 501D	Course Name: **Computer Graphics**
PEC-IT 501D.1	Outline computer graphics system, display devices and various application areas of graphics.
PEC-IT 501D.2	Develop scan conversion algorithms for line, circle and ellipse with examples.
PEC-IT 501D.3	Demonstrate and illustrate 2D and 3D transformation operations such as translation, rotation, scaling, etc.
PEC-IT 501D.4	Analyse and model any kind of 3D objects using viewing, clipping and projection techniques.
PEC-IT 501D.5	Apply various curve and surface representation methods such as B-Spline, Bezier, etc.
PEC-IT 501D.6	Demonstrate and discuss various hidden surface removal algorithms, and lighting and shading models.

Course Code: MC- CS501	Course Name: **Constitution of India**
MC- CS501.1	Know the importance of Indian Constitution and fundamental rights and duties of citizens of India
MC- CS501.2	Know about the administration and modus operandi of Central Government
MC- CS501.3	Know about the administration and modus operandi of State Governments
MC- CS501.4	Know about the administration and modus operandi of local district administrators.
MC- CS501.5	Know about the administration and modus operandi of Election Commission of India
MC- CS501.6	Know about the various Socio-Political Activities and various functionaries involved in the system.

OR

Course Code: MC- CS501	Course Name: **Essence of Indian Knowledge Tradition**
MC- CS501.1	Identify the concept of Traditional knowledge and its importance.
MC- CS501.2	Explain the need and importance of protecting traditional knowledge.
MC- CS501.3	Illustrate the various enactments related to the protection of traditional knowledge.
MC- CS501.4	Interpret the concepts of Intellectual property to protect the traditional knowledge.
MC- CS501.5	Explain the importance of Traditional knowledge in Agriculture and Medicine.
MC- CS501.6	Understand the traditional knowledge and analyse it and apply it to their daily life.

Course Code : PCC- CS591	Course Name :**Data Base Management Systems (LAB)**
PCC- CS591.1	Outline the underlying concepts of database technologies.
PCC- CS591.2	Define and demonstrate DBMS architecture, schema, instance, DDL, DML.
PCC- CS591.3	Experiment with SQL to construct and apply to execute database query using SQL DML/DDL commands.
PCC- CS591.4	List and test theintegrity constraints on a database using a RDBMS and discover relationships.
PCC- CS591.5	Explain Programming in PL/SQL with stored procedures, cursors, packages..
PCC- CS591.6	Compose andimprove/solve the need of DBMS tool for the use of modern software development.

Course Code : PCC- CS592	Course Name :**Operating Systems (LAB)**
PCC- CS592.1	Execute the Linux commands to perform the basic operations related to process and system.
PCC- CS592.2	Examine shell programs and other programs related to pipes, message queue etc.
PCC- CS592.3	Demonstrate the execution of the programs like creating new process, creating orphan process and zombie process based on child-parent relationship.
PCC- CS592.4	Analyze process synchronization, applying the knowledge of semaphore and thread.
PCC- CS592.5	Adapt the concept of signals and their uses in process executions.
PCC- CS592.6	Apply the algorithms of CPU scheduling, process synchronization and process-deadlock, in various fields of research and higher studies.

Course Code: PCC- CS593	Course Name: **Microprocessor and Microcontroller (Lab)**
PCC- CS593.1	Demonstrate instruction set architecture and assembly language programming of the 8085 microprocessor.
PCC- CS593.2	Make use of various instructions of 8085 microprocessor and solve some standard problems using 8085 simulator kits.
PCC- CS593.3	Develop different real-life mini-projects using assembly language programming.
PCC- CS593.4	Demonstrate modern simulator/kit/programming related to the 8085 microprocessor, 8255 PPI and 8051 microcontroller.
PCC- CS593.5	Explain and design the interfacing of 8085 microprocessor with the 8051 microcontroller.
PCC- CS593.6	Justify prewritten programs on 8051 microcontroller simulator using the basic instruction set.

6th SEM

Course Code : PCC- CS601	Course Name **: Software Engineering**
PCC- CS601.1	Explain the principles of software engineering in the context of social, ethical, legal, economic and environmental concerns by building applicable solutions.
PCC- CS601.2	Identify and classify the customer requirements to the solution of complex engineering problems by proper analysis and interpretation of data and processes.
PCC- CS601.3	Estimate software matrices like size, effort and cost, software reliability and quality, etc and apply project management techniques to maximize the productivity.
PCC- CS601.4	Design various components of software using DFD, ERD, Modularization, Use-case diagram, Class diagram, Sequence diagram, etc. following the professional software design guidelines.
PCC- CS601.5	Develop and Test software products following standard coding and testing guidelines.
PCC- CS601.6	Asses the utility of various components of software development process and to combine them to produce different types of software to adapt in the software industries in future.

Course Code : PCC- CS602	Course Name :**Computer Network**
PCC- CS602.1	Explain data communication system, components and the purpose of layered architecture.
PCC- CS602.2	Illustrate the functionalities of each layer of OSI and TCP/IP reference model including their associated protocols.
PCC- CS602.3	Apply the thoughts toward building the networks, secure devices in virtue of analyzing data.
PCC- CS602.4	Support the growing demand of skilled people in the field of network and system administration.
PCC- CS602.5	Justify today's market of digital economy which is very much dependent on computer network skill to provide services in the field of finance, education, transportation, manufacturing, healthcare, retail and so on.
PCC- CS602.6	Analyzethe requirements of enterprises or global corporations to be placed there.

Course Code :PEC- IT601 A	Course Name :**Advanced Algorithms**
PEC-IT601A.1	Analyze the asymptotic performance of algorithms.
PEC-IT601A.2	Write rigorous correctness proofs for algorithms.
PEC-IT601A.3	Demonstrate a familiarity with major algorithms and data structures.
PEC-IT601A.4	Apply important algorithmic design paradigms and methods of analysis.
PEC-IT601A.5	Synthesize efficient algorithms in common engineering design situations.
PEC-IT601A.6	Understand on a wide range of advanced algorithmic problems, their relations and variants, and application to real-world problems.

Course Code :PEC- IT601 B	Course Name :**Distributed Systems**
PEC-IT601B.1	Learn the principles, architectures, algorithms and programming models used in distributed systems.
PEC-IT601B.2	Apply knowledge of distributed systems techniques and methodologies.
PEC-IT601B.3	Explain the design and development of distributed systems and distributed systems applications.
PEC-IT601B.4	Use the application of fundamental Computer Science methods and algorithms in the development of distributed systems and distributed systems applications.
PEC-IT601B.5	Discuss the design and testing of a large software system, and to be able to communicate that design to others.
PEC-IT601B.6	Design and implement sample distributed systems.

Course Code :PEC- IT601 C	Course Name :**Signals & Systems**
PEC- IT601 C.1	Apply the knowledge of linear algebra topics like vector space, basis, dimension, inner product, norm and orthogonal basis to signals.
PEC- IT601 C.2	Analyze the spectral characteristics of continuous-time periodic and a periodic signals using Fourier analysis.
PEC- IT601 C.3	Classify systems based on their properties and determine the response of LSI system using convolution.
PEC- IT601 C.4	Analyze system properties based on impulse response and Fourier analysis.
PEC- IT601 C.5	Apply the Laplace transform and Z- transform for analyze of continuous-time and discrete-time signals and systems.
PEC- IT601 C.6	Understand the process of sampling and the effects of under sampling.

Course Code :PEC- IT601 D	Course Name :**Image Processing**
PEC- IT601 D.1	Review the fundamental concepts of a digital image processing system.
PEC- IT601 D.2	Analyze images in the frequency domain using various transforms.
PEC- IT601 D.3	Evaluate the techniques for image enhancement and image restoration.
PEC- IT601 D.4	Categorize various compression techniques.
PEC- IT601 D.5	Interpret Image compression standards.
PEC- IT601 D.6	Interpret image segmentation and representation techniques.

Course Code :PEC- IT602 A	Course Name :**Parallel & Distributed Algorithms**
PEC- IT602 A.1	Develop and apply knowledge of parallel and distributed computing techniques and methodologies.
PEC- IT602 A.2	Apply design, development, and performance analysis of parallel and distributed applications.
PEC- IT602 A.3	Use the application of fundamental Computer Science methods and algorithms in the development of parallel applications.
PEC- IT602 A.4	Explain the design, testing, and performance analysis of a software system, and to be able to communicate that design to others.
PEC- IT602 A.5	Analyze modeling and performance of parallel programs.
PEC- IT602 A.6	Analyze complex problems with shared memory programming with OpenMP.

Course Code :PEC- IT602 B	Course Name :**Data Mining**
PEC- IT602 B.1	Define the knowledge of mathematics and science on data warehouse, building blocks, Data Mart and recall in independent and life-long learning of data warehouse.
PEC- IT602 B.2	Classify Data warehouse Architecture in the areas of Data acquisition, Data storage and Information delivery and illustrate the engineering principles.
PEC- IT602 B.3	Utilize the architecture and infrastructure of Database Software and model appropriate tools for database software by applying the knowledge of software development by individual or team.
PEC- IT602 B.4	Analyze Metadata types by functional areas and assume effective reports on Business metadata by understanding of the engineering principles of metadata.
PEC- IT602 B.5	Justify effective reports on Data acquisition, Data storage, and Information delivery and evaluate the ability for life-long learning on data storage.
PEC- IT602 B.6	Discuss Data mining and Knowledge Discovery Process, based on the knowledge of mathematics and engineering fundamentals for developing applications in societal, health, safety, legal and cultural issues.

Course Code :PEC- IT602 C	Course Name :**Human Computer Interaction**
PEC- IT602 C.1	Provide an overview of the concepts relating to the design of human-computer interfaces in ways making computer-based systems comprehensive, friendly and usable.
PEC- IT602 C.2	Understand the theoretical dimensions of human factors involved in the acceptance of computer interfaces.
PEC- IT602 C.3	Understand the important aspects of implementation of human-computer interfaces.
PEC- IT602 C.4	Identify the various tools and techniques for interface analysis, design, and evaluation.
PEC- IT602	Identify the impact of usable interfaces in the acceptance and

C.5	performance utilization of information systems.
PEC- IT602 C.6	Identify the importance of working in teams and the role of each member within an interfacedevelopment phase.

Course Code :PEC- IT602 D	Course Name :**Pattern Recognition**
PEC- IT602 D.1	Explain and define concepts of pattern recognition.
PEC- IT602 D.2	Explain and distinguishprocedures, methods and algorithms related to pattern recognition.
PEC- IT602 D.3	Apply methods from the pattern recognition for new complex applications.
PEC- IT602 D.4	Analyze and breakdown problem related to the complex pattern recognition system.
PEC- IT602 D.5	Design and develop a pattern recognition system for the specific application.
PEC- IT602 D.6	Evaluate quality of solution of the pattern recognition system.

Course Code : OEC- IT601A	Course Name :**Numerical Methods**
OEC- IT601A.1	Recalling the basic mathematical tools such as, derivative, real integration, solution of equations, existence of solution of system of linear equations and differential equation.
OEC- IT601A.2	Describe the concept of error, operators and interpolation. Numerical approach of solving missing term, finding of polynomials, integrated value, solution of algebraic equations, system of linear equations and differential equation.
OEC- IT601A.3	Use interpolation, integration for data analysis and finding of volume of rough surface. Apply different numerical techniques to solve algebraic equations, system of linear equations in iterative way. Solve boundary value wave and heat equations using differential equations.
OEC- IT601A.4	Analyze different real time problems and categorize them during the process of solving, by numerical technique mentioned.
OEC- IT601A.5	Justify and make gradation of above mentioned numerical tools and determine the right approach to find the optimal solution for multidisciplinary engineering problems.
OEC- IT601A.6	Design a working model and build a path by which a new approach can be generated to create a new problem appreciated by academics, research & emerging direction in industry.

Course Code : OEC- IT601B	Course Name :**Human Resource Development and Organizational Behavior**
OEC-IT601B.1	Interpret given organization structure, culture, climate
OEC-IT601A.2	Interpret how to behave in a group through proper communication
OEC-IT601A.3	Interpret how to participate in a group decision making process
OEC-IT601A.4	Know about various leadership qualities required keeping in mind Various Organizational Structures and their Effects on Human Behaviour
OEC-IT601A.5	Learn the art of motivating employees by studying various theories and by their application for smooth functioning of the organisation.
OEC-IT601A.6	Learn about different types of Conflicts which are common in an organisation and how to handle those conflicting situations and will also Learn the art of negotiation and bargaining.

Course Code :PROJ- CS601	Course Name :**Research Methodology**
PROJ-CS601.1	Learn about various types of research and importance of literature review
PROJ-CS601.2	Learn about various data collection processes
PROJ-CS601.3	Learn about data processing and analysis of data by applying different statistical packages (e.gSigma STAT,SPSS for student t-test, ANOVA, etc.)
PROJ-CS601.4	Learn about how to conduct a research work ethically to avoid plagiarism
PROJ-CS601.5	Know about Intellectual Property Rights and patent law, commercialization, copy right, royalty, trade related aspects of intellectual property rights (TRIPS) etc.
PROJ-CS601.6	Learn how to publish a scholarly research article by properly designing the research paper using citation etc. Will also learn how to interpret the results and how to write a research project report

Course Code :PCC- CS691	Course Name :**Software Engineering Lab**
PCC- CS691.1	Identify and classify the customer requirements for the solution of complex engineering problems by proper analysis and interpretation of data and processes supported by standard documentation.
PCC- CS691.2	Analyzethe software processes by mapping requirements in to Use case diagrams/ Data Flow Diagrams and Entity Relationship Diagrams for given case studies.
PCC- CS691.3	Experiment with modern tools like Rational rose++, Smartdraw, Erdraw, etc. to design dynamic behaviour of software with modular programming, class diagrams, sequence diagrams, etc. following standard guidelines.
PCC- CS691.4	Estimate software matrices like size, effort and cost , software reliability and quality, etc and plan development schedule using PART and GNATT charts.

PCC- CS691.5	Design the Test cases and the Test suits for the given case studies using Black box and White box techniques.
PCC- CS691.6	Determine and evaluate the various components of software development process practically and to combine them to produce different types of software to adapt in the software industries in future.

Course Code :PCC- CS692	Course Name :**Computer Networks Lab**
PCC- CS692.1	Discuss the hardware, related to computer network.
PCC- CS692.2	Analyze the performance of network protocols such as message queue, stop-and-wait, CRC etc.
PCC- CS692.3	Examine UNIX socket programs efficiently, based on the knowledge of client server paradigm.
PCC- CS692.4	Justify the network traffic in terms of congestion control mechanism.
PCC- CS692.5	Test the datagram forwarding and routing mechanisms compatible with UNIX platform.
PCC- CS692.1	Design networks in small scale by configuring devices with the help of knowledge in network addressing.

7TH SEM

Course Code : PEC- CS701A	Course Name : **Quantum Computing**
PEC-CS701A.1	To understand the foundations of post-quantum and implications of quantum computing.
PEC-CS701A.2	To understand the quantum computing paradigm. Understand Matrices & Operators in Quantum computing.
PEC-CS701A.3	To understand the power and limitation of quantum computers and the underlying power of quantum mechanics for computation.
PEC-CS701A.4	To design and analyse quantum algorithms. Grasp the notions of Tensor Products and Density Operator.
PEC-CS701A.5	To evaluate the principles of Quantum Measurement Theory. Distinguishing Quantum states & Measures.
PEC-CS701A.6	To understand recent trends in Quantum Computing and to know Quantum Computing Applications of Genetic Programming.

Course Code : PEC- CS701B	Course Name : **Cloud Computing**
PEC-CS701B.1	To interpret the main concepts, key technologies, strengths, and limitations of cloud computing and the possible applications for state-of-the-art cloud computing,
PEC-CS701B.2	To illustrate various problems and evaluate related cloud computing solutions
PEC-CS701B.3	To apply the architecture and infrastructure of cloud computing, including SaaS, PaaS, IaaS, public cloud, private cloud and hybrid cloud to different problems
PEC-CS701B.4	To analyze cloud provider for a defined environment and to a specific platform in a cost effective way.
PEC-CS701B.5	To analyze case studies to derive the best practice model to apply when developing and deploying cloud based applications
PEC-CS701B.6	To understand recent trends and applications in the Cloud computing.

Course Code : PEC- CS701C	Course Name : **Digital Signal Processing**
PEC-CS701C.1	To classify Discrete time signals and systems
PEC-CS701C.2	To execute Z transform on different systems and represent with realization technique.
PEC-CS701C.3	To implement discrete Fourier transform and Fast Fourier transform on time domain signals.
PEC-CS701C.4	To implement FIR and IIR digital filters with given specifications and find the frequency response
PEC-CS701C.5	To understand and designing of Digital filters.
PEC-CS701C.6	To understand recent trends and applications of Digital Signal Processing.

Course Code : PEC- CS701D	Course Name : **Multi-agent Intelligent Systems**
PEC-CS701D.1	To understands the conceptual and technical foundation of multi-agent systems.
PEC-CS701D.2	To gain Knowledge in Multi agent and Intelligent agents.
PEC-CS701D.3	To understand Agents and security.
PEC-CS701D.4	To Gain Knowledge in Multi agent and Intelligent agents.
PEC-CS701D.5	To design and engineer intelligent systems as multi-agent systems, by integrating techniques
PEC-CS701D.6	To build complex computational and socio-technical systems using agent-oriented technologies and methodologies

Course Code : PEC- CS701E	Course Name : **Machine learning**
PEC-CS701E.1	To Understand a wide variety of learning algorithms.
PEC-CS701E.2	To understand how to apply a variety of learning algorithms to data using various tools of Machine Learning.
PEC-CS701E.3	To identify the strengths and weaknesses of many popular machine learning approaches.
PEC-CS701E.4	To analyze the performance of learning algorithms and model selection
PEC-CS701E.5	To identify mathematical relationships within and across Machine Learning algorithms and the paradigms of supervised and un-supervised learning.
PEC-CS701E.6	To apply machine learning techniques in solving complex real world problems.

Course Code : PEC- CS702A	Course Name : **Neural Networks and Deep Learning**
PEC-CS702A.1	To provide an introduction to the field of artificial neural networks and deep learning.
PEC-CS702A.2	Understand motivation and functioning of the most common types of deep neural networks.
PEC-CS702A.3	To analyze and evaluate model performance and interpret results
PEC-CS702A.4	To analyze how to solve practical problems via artificial neural networks and deep learning techniques.
PEC-CS702A.5	Apply Artificial Neural Networks and Deep Neural Networks in solving complex real world problems
PEC-CS702A.6	To promote further independent learning on the topics of artificial neural networks and machine learning.

Course Code : PEC- CS702B	Course Name : **Soft Computing**
PEC-CS702B.1	To interpret the main concepts, key technologies, strengths, and limitations of soft computing methods.
PEC-CS702B.2	To understand supervised learning methods for neural network models
PEC-CS702B.3	To demonstrate the use of back propagation algorithm to develop multi layer feed forward neural networks
PEC-CS702B.4	To understand Genetic Algorithms and applications of Genetic Algorithm.
PEC-CS702B.5	To understanding fuzzy logic to handle uncertainty.
PEC-CS702B.6	To identify an appropriate soft computing technique to build an Intelligent Machine.

Course Code : PEC- CS702C	Course Name : **Ad-hoc and Sensor Network**
PEC-CS702C.1	Provide an overview about sensor networks and emerging technologies
PEC-CS702C.2	To study about the node and network architecture of sensor nodes and its execution environment.
PEC-CS702C.3	To understand the concepts of communication, MAC, routing protocols and also study about the naming and addressing in WSN
PEC-CS702C.4	To learn about topology control and clustering in networks with timing synchronization for localization services with sensor tasking and control
PEC-CS702C.5	To study about sensor node hardware and software platforms and understand the simulation and programming techniques.
PEC-CS702C.6	To promote further independent learning on the topics of ad hoc and wireless sensor networks.

Course Code : PEC- CS702D	Course Name : **Information Theory and Coding**
PEC-CS702D.1	To define and apply the basic concepts of information theory (entropy, channel capacity etc.)
PEC-CS702D.2	To learn the principles and applications of information theory in communication systems.
PEC-CS702D.3	To study various data compression methods and describe the most common such methods.
PEC-CS702D.4	To understand the theoretical framework upon which error-control codes are built.
PEC-CS702D.5	To apply convolution codes for performance analysis & cyclic codes for error detection and correction.
PEC-CS702D.6	To design BCH codes for Channel performance improvement

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Course Code : PEC- CS702E	Course Name : **Cyber Security**
PEC-CS702D.1	To gain knowledge about securing both clean and corrupted systems, protect personal data, and secure computer networks.
PEC-CS702D.2	To understand key terms and concepts in cyber law, intellectual property and cyber crimes, trademarks and domain theft.
PEC-CS702D.3	To apply the concepts of secure software development practices and principles of web security.
PEC-CS702D.4	To incorporate approaches for risk management and best practices.
PEC-CS702D.5	To develop an understanding of security policies (such as confidentiality, integrity, and availability), as well as protocols to implement such policies.
PEC-CS702D.6	To gain familiarity with prevalent network and distributed system attacks, defences against them, and forensics to investigate the aftermath.

Course Code : OEC-CS 701A	Course Name : **Operation Research**
OEC-CS 701A	Students should be proficient in the application of the laws of logic to mathematical statements.
OEC-CS 701A	Select appropriate OR methods like Simplex, TP, TS, TSP, Network Analysis to apply to various types of problems in engineering and science inconsideration of the mathematical operations involved, accuracy requirements, and available computational resources.
OEC-CS 701A	Prepare students for realization of journal papers outcomes, and expose them to the world of research. Illustrate the current research works and publications of the subjects in different fields adopted by the students as per course curriculum in various journals and literature.
OEC-CS 701A	To explore and enhance research potential explain how the ideas those are adopted can be implemented through projects and demonstrate various models, recent project proposals executing the knowledge adopted from the course.
OEC-CS 701A	An ability to function on multi-disciplinary teams. Lighten on the latest and modern developments in the fields.
OEC-CS 701A	An understanding of professional, ethical, legal, security and social issues and responsibilities. An ability to analyze the local and global impact of computing on individuals, organizations, and society.

Course Code : PEC- CS701B	Course Name : **Multimedia Systems**
PEC-CS701B.1	To identify a range of concepts, techniques and tools for creating and editing the interactive multimedia applications
PEC-CS701B.2	To understand the hardware and software needed to create projects using creativity and organization to create them.
PEC-CS701B.3	To understand the concepts of Synchronization, Storage models and Access Techniques.
PEC-CS701B.4	To incorporate approaches for Image and Video Database, Document Architecture and Content Management.

PEC-CS701B.5	To understand recent trends and applications of Multimedia Systems.
PEC-CS701B.6	To develop multimedia skills understanding the principal players of individual players in multimedia teams in developing projects.

Course Code : PEC- CS701C	Course Name : **Introductionto PhilosophicalThoughts**
PEC-CS701C.1	Understand clearly various aspects of Vedas and Upanishadicviews: Atman, Jagrata etc.
PEC-CS701C.2	Interpret the thoughts related to Carvaka schooland its epistemology, metaphysics and ethics. Mukti etc.
PEC-CS701C.3	Learn the philosophical thoughts associated with Jainism.
PEC-CS701C.4	Learn the philosophical thoughts associated with Buddhism and will be able to interpret various theories in School of Buddhism.
PEC-CS701C.5	Understand the width and depth of Indian Philosophical Concepts which will help them to chose the right path in the journey of life.
PEC-CS701C.6	Gain the power of self-realisation. Also will Gain the power of understanding the Existence of Super Power i.e God Almighty

Course Code : HSMC 701	Course Name : **Project Management and Entrepreneurship**
HSMC 701.1	Learn about what entrepreneurship is and how to be motivated for emerging as a budding entrepreneur
HSMC 701.2	Learn the idea of incubation and its application and various Government Schemes available for the budding entrepreneurs.
HSMC 701.3	Learn about various National and International level Venture Capitalists and their project funding procedures
HSMC 701.4	Learn about Project Feasibility Studies, Preparation of Detailed Project Report, Technical Appraisal, Economic/Commercial/Financial Appraisal including Capital Budgeting Process, Social Cost Benefit Analysis etc.
HSMC 701.5	Learn how to plan a project considering Work Breakdown Structure (WBS) and Organization Breakdown Structure (OBS). Will also learn about Phased Project Planning, Project Scheduling and Costing through different cost analysis techniques
HSMC 701.6	Learn how to monitor a project continuously and ensure proper control on the progress of the project for its timely completion, cost effectiveness etc.

Course Code : PROJ- CS781	Course Name : **Project II**
PROJ-CS781.1	To survey the literature; Identify and classify the requirements for the solution of complex engineering problems.
PROJ-CS781.2	To define the requirements of the project by proper analysis and interpretation of data and processes supported by standard documentation.
PROJ-CS781.3	To analyzethe processes by mapping requirements in to Use case diagram(s)/ Data Flow Diagram(s)/ Algorithm(s)/ User-Interface design/ Entity Relationship Diagram(s) etc.

PROJ-CS781.4	To design behaviour of the application with modular programming and program flowchart/ class diagrams and sequence diagrams, etc., following standard guidelines.
PROJ-CS781.5	To estimate project metrics like size, effort and cost , reliability and quality, etc and plan project development schedule using PART and GNATT charts.
PROJ-CS781.6	To justify the project work with technical documentation, presentation, and discussions as a group to share knowledge.

8TH SEM

Course Code : PEC-CS801A	Course Name : **Signal and Networks**
PEC-CS801A.1	To understand the objective and overview of signal and system networks.
PEC-CS801A.2	To understanding the fundamental characteristics of signals and systems.
PEC-CS801A.3	To apply the concepts of Periodic signal analysis with Fourier series and properties.
PEC-CS801A.4	To understanding signals and systems in terms of elements of electrical network.
PEC-CS801A.5	To analyze One and two port network parameters and functions.
PEC-CS801A.6	To development of the mathematical skills to solve problems.

Course Code : PEC-CS801B	Course Name : **Cryptograph y & Network Security**
PEC-CS801B.1	To define complex problems describing the basic Mathematics on Number theory, probability theory and their application in Security
PEC-CS801B.2	To analyze the problems and solutions of Cryptographic algorithms and its applicability in network security and describe the concepts of principles of security, types of attacks, symmetric key cryptography and asymmetric key cryptography and their differences.
PEC-CS801B.3	To use modern tools to implement the techniques like, DES, IDEA, RC4, RC5, DSA, Elgamal and SSL protocol etc
PEC-CS801B.4	To justify the applications of the aforesaid techniques in network security.
PEC-CS801B.5	To develop the systems which can withstand against the different types of attacks.
PEC-CS801B.6	To elaborate the importance of communications in terms of confidentiality and integrity to serve the society in a better way.

Course Code : PEC-CS801C	Course Name : **Speech and Natural Language Processing**
PEC-CS801C.1	To understand the fundamental concepts and techniques of natural language processing (NLP).
PEC-CS801C.2	To analyze the diffract approaches to discourse, generation, dialogue and summarization within NLP
PEC-CS801C.3	To understand current methods for statistical approaches to machine translation.
PEC-CS801C.4	To understand of the computational properties of natural languages and the commonly used algorithms for processing linguistic information
PEC-CS801C.5	To analyze NLP models and algorithms using both the traditional symbolic and the more recent statistical approaches.

PEC-CS801C.6	To understand Computational Lexical Semantics Introduction to Lexical Semantics.

Course Code : PEC-CS801D	Course Name : **Web and Internet Technology**
PEC-CS801D.1	To explain the principal of Internetworking, TCP/IP protocols, World Wide Web, client-server architecture, IP addressing, routing etc.
PEC-CS801D.2	To examine and evaluate the need for secured web application development with client-side, server-side scripting languages.
PEC-CS801D.3	To construct web programs using the web languages--HTML, XML, JavaScript, Applet, Perl, etc.
PEC-CS801D.4	To design and develop small interactive websites using modern tools following the professional web based engineering solutions, ethics and management techniques.
PEC-CS801D.5	To determine and combine the advanced technologies like network security, multimedia applications, search engine, web crawler, etc with the websites.
PEC-CS801D.6	To assess the need and utility for different web components and their role-play to produce huge distributed data driven web applications to contribute to lifelong learning.

Course Code : PEC-CS801E	Course Name : **Internet of Things**
PEC-CS801E.1	To understand the application areas of IOT.
PEC-CS801E.2	To realize the revolution of Internet in Mobile Devices, Cloud & Sensor Networks.
PEC-CS801E.3	To understand building blocks of Internet of Things and characteristics.
PEC-CS801E.4	To analyze various M2M and IoT architecture.
PEC-CS801E.5	To evaluate design issues in IoT applications.
PEC-CS80.E.6	To understand Recent trends in smart sensor for day to day life

Course Code : OEC- CS801A	Course Name : **Big Data Analysis**
OEC-CS801A.1	To understand the Big Data Platform and its Use cases.
OEC-CS801A.2	To provide an overview of Apache Hadoop .
OEC-CS801A.3	To analyze HDFS Concepts and Interfacing with HDFS
OEC-CS801A.4	To evaluate and learn business case studies for big data analytics.
OEC-CS801A.5	To Understand no big data management
OEC-CS801A.6	To perform map -reduce analytics using Hadoop and related tools

Course Code : OEC- CS801B	Course Name : **Cyber Law and Ethics**
OEC-CS801B.1	To understands the conceptual and technical foundation cyber security.
OEC-CS801B.2	To exhibit knowledge to secure corrupted systems, protect personal data, and secure computer networks in an Organization
OEC-CS801B.3	To identify and analyze statutory, regulatory, constitutional, and organizational laws that affects the information technology professional.
OEC-CS801B.4	To apply case law and common law to current legal dilemmas in the technology field.
OEC-CS801B.5	To apply diverse viewpoints to ethical dilemmas in the information technology field and recommend appropriate actions,
OEC-CS801B.6	To understand principles of web security and to guarantee a secure network by monitoring and analyzing the nature of attacks through cyber/computer forensics software/tools.

Course Code : OEC- CS801C	Course Name : **Mobile Computing**
OEC-CS801C.1	To understands the conceptual and technical foundation cyber security.
OEC-CS801C.2	To exhibit knowledge to secure corrupted systems, protect personal data, and secure computer networks in an Organization
OEC-CS801C.3	To identify and analyze statutory, regulatory, constitutional, and organizational laws that affect the information technology professional.
OEC-CS801C.4	To apply case law and common law to current legal dilemmas in the technology field.
OEC-CS801C.5	To apply diverse viewpoints to ethical dilemmas in the information technology field and recommend appropriate actions,
OEC-CS801C.6	To understand principles of web security and to guarantee a secure network by monitoring and analyzing the nature of attacks through cyber/computer forensics software/tools.

Course Code : OEC- CS801D	Course Name : **Robotics**
OEC-CS801D.1	To understand the knowledge in robotics, robot structures and their workspace.
OEC-CS801D.2	To develop skills in performing spatial transformations associated with rigid body motions.
OEC-CS801D.3	To develop skills in perform kinematics analysis of robot systems.
OEC-CS801D.4	To analyze knowledge of the singularity issues associated with the operation of robotic systems.
OEC-CS801D.5	To apply knowledge and analysis skills associated with trajectory planning.
OEC-CS801D.6	To provide knowledge and skills associated with robot control.

Course Code : OEC- CS801E	Course Name : **Soft Skill & Interpersonal Communication**
OEC-CS801E.1	
OEC-CS801E.2	
OEC-CS801E.3	Will be updated...
OEC-CS801E.4	
OEC-CS801E.5	
OEC-CS801E.6	

Course Code : OEC- CS802A	Course Name : **E-Commerce and ERP**
OEC-CS802A.1	To describe the importance and impact of E-commerce on business models and strategies which help to have better concept of retailing by effective market research.
OEC-CS802A.2	To compare and contrast different trading relationships among business and consumers.
OEC-CS802A.3	To evaluate the effect in a supply chain, analyze the causes, and recommend possible solutions.
OEC-CS802A.4	To develop awareness of ethical, social and legal aspects of E-commerce including electronic payment system.
OEC-CS802A.5	To understand basic concepts of ERP systems for manufacturing or service companies
OEC-CS802A.6	To analyze the technical aspect of ERP and E-Commerce and their roles in business environment.

Course Code : OEC- CS802B	Course Name : **Micro-electronics and VLSI Design**
OEC-CS802B.1	To understand the static and dynamic behaviour of MOS and the effects of the MOS transistor model.
OEC-CS802B.2	To be aware about the trends in semiconductor technology, and how it impacts scaling and its effect on device density, speed and power consumption.
OEC-CS802B.3	To understand CMOS transistor as a switch and its capacitance.
OEC-CS802B.4	To design digital systems using MOS circuits (Static and Switching characteristics of inverters)
OEC-CS802B.5	To learn Layout, Stick diagrams, Fabrication steps.
OEC-CS802B.6	To understand the concept behind verification and testing of different implementation approaches used in industry.

Course Code : OEC- CS802C	Course Name : **Economic Policies inIndia**
OEC-CS802C.1	Identify the determinants which are responsible as well as required for sustainable development of Indian economy.
OEC-CS802C.2	Learn about broad demographic features of Indian population and the causes of poverty associated with income inequality and social inequality. Will also Learn about resource base of India and various issues and policies in financing social and economic infrastructure development
OEC-CS802C.3	Learn about various Five-Year Plans and their contributions related to development of Agricultural Sector (Primary Sector), Industrial Manufacturing Sector (Secondary sector) and Service Sector (Tertiary Sector)
OEC-CS802C.4	Learn about Fiscal Policy of GOI, Monitory Policy of RBI along with various areas of Money, Banking and Public Finance
OEC-CS802C.5	Learn about Foreign Exchange, BOP, Export-Import policy of Government of India (GOI)
OEC-CS802C.6	Learn aboutvarious aspects ofEconomic Reforms,Rationale of internal and external reforms; Globalization of Indian economy; WTO and its impact on the different sectors of the economy etc.

Course Code : PROJ- CS881	Course Name : **Project-III**
PROJ- CS881	To determine the software and hardware requirements from implementation perspective of Project-II
PROJ- CS881	To interpret the system design of project-I in to executable code(s) using modern programming languages to Build the system.
PROJ- CS881	To test and validate the developed system following standards testing techniques.
PROJ- CS881	To adapt the management techniques to handle a project as a whole.
PROJ- CS881	To justify the project work with technical documentation, presentation, and discussions as a group to share knowledge.
PROJ- CS881	To determine all the system development phases towards the completion of the Project and analyze/compare the result(s) (for research based projects) ;evaluate and maximize system performances which contribute to lifelong learning.