MAR BASELIOS CHRISTIAN COLLEGE OF ENGINEERING,PEERMADE				
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING				
Course Outcome- KTU				
	Course Code	Course	Course Outcomes	
S1 & S2	MA101	Calculus	CO1	At the end of the course students will be able to check convergence of infinite series.
			CO2	Acquire a basic knowledge of phenomina involving continuous change of variable.
			CO3	Understand differential calculus of functions of one or more variables and of vector functions.
			CO4	Find areas and volumes using integrals.
			CO5	Analyse the application of vector valued functions in physical applications.
			CO6	Understand integral calculus of functions of one or more variables and of vector functions.
	PH100	Engineering Physics	CO1	Differentiate different types of oscillations and apply knowledge in engineering systems
			CO2	Differentiate interference, diffraction and polarisation and apply knowledge in daily life situations.
			CO3	Distinguish between different types of superconductors.
			CO4	Explain the principles of physics using theories of quantum mechanics statistical mechanics and optics.
			CO5	Apply the knowledge of acoustics in the construction of buildings.
			CO6	Explain the construction and working of different laser systems and their applications.
	CY100	Engineering Chemistry	CO1	Students will be able to elucidate the structures of organic molecules from spectral data.
			CO2	Students will be able to understand the fundamental and applied concepts of Electrochemistry
			CO3	Students develop understanding of the theories of instrumental methods in analytical chemistry.
			CO4	Students will be able to understand the properties and applications of engineering materials.
			CO5	Students will be able to compute the property of fuels and lubricating oils.
			CO6	Students will be able to make technology choice to deal with water quality issues
			CO7	The student will be equipped to take up chemistry related topics as a part of their project works during higher semester of the course.
	BE100	Engineering Mechanics	CO1	Identify all the forces associated with a static frame work and to draw free body diagrams.

			CO2	Compute the reactions necessary to ensure static equilibrium
			CO3	Compute Centre of Gravity and Moment of Inertia.
			CO4	Solve mechanics problems associated with friction forces.
			CO5	Describe the motion of a particle in terms of its position, velocity and acceleration in different frames of reference and to define the forces causing the motion of a particle.
			CO6	Explain the concept of mechanical vibrations.
	BE110	Engineering Graphics	CO1	Able to prepare the orthographic projections of points and straight lines placed in various quadrants
			CO2	Demonstrate the ability to draw orthographic projections of various solids.
			CO3	Ability to draw and interpret the sectioned views of solids.
			CO4	Ability to draw the developments of various solids.
			CO5	Will be confident in preparing the isometric and perspective views of various solids.
			CO6	Ability to draw the projections of intersection of solids and perform free hand sketching.
	BE-101-01	Introdcution to Civil Engineering	CO1	Illustrate various types, uses and properties of various building materials.
			CO2	Explain the method of construction of different components of a building.
	BE-101-04	Introduction to Electronics Engineering	CO1	Identify active and pasive electronic components.
			CO2	Design and setup simple circuits using diodes and transistors.
			CO3	Measuring voltages and current and monitored using electronic measuring instruments.
	BE-101-05	Introduction to Computing and Problem Solving	CO1	Students can design algorithmic solution to problems.
			CO2	Students can convert algorithms to Python programs
			CO3	Able to design modular Python programs using functions
			CO4	Can design programs with Interactive Input and Output, utilizing arithmetic expression repetitions, decision making, arrays.
			CO5	Can design programs using file Input and Output.
			CO6	Able to develop recursive solutions
	BE103	Introduction to Sustable Engineering	CO1	The student will be able to understand the different types of environmental pollution problems and their sustainable solutions.
			CO2	The student will be able to acquire attitudes of care and concern for ecologically sustainable development.

			CO3	The student will be able to recognize the implications of the ways to feed and provide one self.
			CO4	The student will be able to develop skills to investigate and solve issues in the environment.
			CO5	The student will be able to work in the area of sustainability for research and education.
			CO6	The student will be having a broader perspective in contributing for sustainable practices by utilizing the engineering knowledge and principles gained from this course.
	CE100	Basics of Civil Engineering	CO1	Discuss the fundamental aspects of civil engineering.
			CO2	Discuss the fundamentals for planning and setting out a building.
			CO3	Understand the concepts of surveying for making horizontal & vertical measurements.
			CO4	Discuss the uses of various building materials.
			CO5	Explain the method of construction of different components of a building.
			CO6	Discuss about various services in a building.
	ME 100	Basics of Mechanical Engineering	CO1	Describe fundamentals of Thermodynamics and air standard cycle.
			CO2	Explain the working of various energy conservation devices.
			CO3	Distinguish different refrigeration and air conditioning system.
			CO4	Identify various parts of an automobile.
			CO5	Select the appropriate manufacturing process.
			CO6	Describe elements and functions of various machine tools.
	EE100	Basics of Electrical Engineering	CO1	Define the fundamental laws of electrical and magnetic circuit
			CO2	Design a circuit to suit the need and apply nodal and mesh analysis
			CO3	Analyze simple Ac circuits with sources and passive elements
			CO4	Explain the generation, transmission and distribution of electrical energy and about different renewable energy sources
			CO5	Analyze the performance of different type of Dc motors

			CO6	Describe the principle of operation of different type of AC motors
	EC100	Basics of Electronics Engineering	CO1	Understand the types, specification and standard values and applications of various passive and active components.
			CO2	Get an idea about the working and applications of different types of semiconductors, diodes and transistors.
			CO3	Understand the working of rectifiers, amplifiers and oscillators.
			CO4	Get a basic idea of analog and digital integrated circuits and various measuring instruments.
			CO5	Understand the concepts of radiocommunication and satellite communication.
			CO6	Get a fundamental idea about mobile and optical communication and entertainment electronics.
	MA102	Differential Equations	CO1	Identify and solve homogeneous differential equations.
			CO2	Solve non-homogeneous differential equations.
			CO3	Evaluation of Fourier series.
			CO4	Identify and solve problems in partial differential equations.
			CO5	Apply one diamensional wave equation to solve problems in different domain.
			CO6	Apply one diamensional heat equation to solve problems in different domain.
	BE102	Design Engineering	CO1	Appreciate the different elements involved in good designs and to apply them in practice.
			CO2	Aware of the product oriented and user oriented aspects that make the design a success
			CO3	Think of innovative designs incorporating different segments of knowledge gained in the course.
			CO4	A boarder perspective of design covering function, cost, environmental sensitivity, safety and other factors other than engineering analysis.
			CO5	Gain an ability to design a system, component or process to meet desired needs within realistic constraints.
			CO6	Capable to apply knowledge of mathematics, science and engineering.

	CS100	Computer Programming	CO1	Ability to deal with different parts of a program and I/O methods,Understand C language constructs and analyse problem using control statements
			CO2	Implement and use basic data structure such as arrays, strings matrix, structure and union
			CO3	Develop and solve problems using pointers.
			CO4	Analyse problems, identify subtasks and implement them as functions.
			CO5	Apply sorting and searching techniques, to solve application programs.
			CO6	Explain the concept of file system for handling data storage and apply it for solving problems.
	PY100	Engineering Physics Lab	CO1	Gain knowledge about different types of oscillations and resonant electrical circuits.
			CO2	Understand principle, concept, working and application of new technology and comparison of results with theoretical calculations.
			CO3	Apply and demonstrate the theoretical concepts of Engineering Physics and develop scientific attitude.
			CO4	Design new experiments / instruments with practical knowledge.
			CO5	Develop skills to impart practical knowledge in real time solutions.
			CO6	Apply theoretical concepts of LASER and Grating.
	CY 110	Engineering Chemistry Lab	CO1	Students will be able to elucidate the structures of organic molecules from spectral data.
			CO2	Students will be able to understand the fundamental and applied concepts of Electrochemistry.
			CO3	Students develop understanding of the theories of instrumental methods in analytical chemistry.
			CO4	Students will be able to understand the properties and applications of engineering materials.
			CO5	Students will be able to compute the property of fuels and lubricating oils.

			CO6	Students will be able to make technology choice to deal with water quality issues.
			CO7	The student will be equipped to take up chemistry related topics as a part of their project works during higher semester of the course.
	CE110	Civil Engineering Workshop	CO1	Student should be able to set out a building using tape and cross staff
			CO2	Student should be able to determine area and mass moment of inertia
			CO3	Student should be able to construct one and a half and two brick walls using English bond
			CO4	Student should be able to calculate the area and volume of various features of a building
			CO5	Student should be able to determine and vertical distance between points
			CO6	Student should be able to determine areas of irregular shapes.
	EE110	Electrical Engineering Workshop	CO1	Understand the different supply arrangements and their limitations, standard voltages and their tolerances.
			CO2	Familiarize with safety aspects of electrical systems and importance of protective measures in wiring systems.
			CO3	Select the suitable wires, cables and other accessories used in wiring.
			CO4	Work in the area of creating awareness of energy conservation in electrical systems.
			CO5	Wire up simple lighting circuits for domestic buildings, distinguish between light and power circuits.
			CO6	Measure electrical circuit parameters and current, voltage and power in a circuit.
	EC110	Electronics Engineering Workshop	CO1	Identify different electronic components like resistors, capacitors, inductors, transformers diodes,transister etc.
			CO2	Familiarize testing and measuring instruments like the multimeter, function generator, power supply & CRO.
			CO3	Assemble and connect different circuits on a breadboard.

			CO4	Acquire soldering and desoldering skills, useful in electronic circuit interconnections.
			CO5	Familiarize EDA tool and public addressing electronic systems
			CO6	Assemble electronic circuits/systems on general purpose PCB.
	CS110	Computer Science Workshop	CO1	To familiarise students with basic hardware and software tools.
			CO2	To implement algorithms studied in the course Introduction to computing and problem solving.
			CO3	To learn the implementation of control structures,iterations and recursive function,Lists,Tuples and dictionaries.
			CO4	To implement operations on file.
			CO5	To implement a micro Project using Python.
	CS120	Computer Programming Lab	CO1	Analyze a problem
			CO2	Find appropriate programming language construct should be us
			CO3	Implement C Program using conditions and loop
			CO4	Implement C Program using arrays, structures
			CO5	Implement C Program using functions
			CO6	Implement C Program using pointers and files
S3	MA201	Linear Algebra & Complex Analysis	CO1	At the end of the course students will be able to solve any given system of linear equations.
			CO2	Find the eigen values of a matrix and how to diagonalise a matrix.
			CO3	Identify analytic functions and harmonic functions.
			CO4	Evaluate real definite integrals as application of residue theorem.
			CO5	Identify conformal mappings
			CO6	Find regions that are mapped under certain transformation.
	CS201	Discrete Computational Structures	CO1	Identify and apply operations on discrete structures in computing
			CO2	Verify the validity of an argument using logic
			CO3	Construct proof by different methods
			CO4	Solve problems using algebraic structures
			CO5	Solve problems using counting techniques and combinatories
			CO6	Apply recurrence relations to solve problems in different domains

	CS203	Switching Theory and Logic Design	CO1	Apply the basic concepts of Boolean algebra for the simplification and implementation of logic functions using suitable gates namely NAND, NOR etc.
			CO2	Design simple Combinational Circuits such as Adders, Subtractors, Code Convertors, Decoders, Multiplexers, Magnitude Comparators etc.
			CO3	Design Sequential Circuits such as different types of Counters, Shift Registers, Serial Adders, Sequence Generators.
			CO4	Use Hardware Description Language for describing simple logic circuits.
			CO5	Apply algorithms for addition/subtraction operations on Binary, BCD and Floating Point Numbers.
	HS200	Business Economics	CO1	Understand elementary principles of Economics and Business Economics.
			CO2	Analyse the various market situations with good grasp on the effect of trade cycle.
			CO3	Anlayse the basic macro-economic concepts and monetary theory.
			CO4	Undestand macro- economic concepts to improve their ability to analyse the business climate.
			CO5	Analyse their employability by combining their technical knowledge with appropriate economic models.
			CO6	Attain knowledge of elementary accounting concepts used for prepairing balance sheet and interpretation of balace sheets.
	CS207	Electronics Devices and Circuits	CO1	Understand different programming methodologies and analyze performance of algorithms using asymptotic notations
			CO2	Apply and manipulate data using linear data structures like arrays, linked list, stack and queues.
			CO3	Illustrate and understand memory management techniques and string functions.
			CO4	Apply and manipulate data using nonlinear data structures like trees and graphs to design algorithms for various applications.
			CO5	Analyze and compare various techniques for searching and sorting.
			CO6	Illustrate various hashing techniques.
	CS205	Data Structures	CO1	Understand elementary principles of Economics and Business Economics.

			CO2	Analyse the various market situations with good grasp on the effect of trade cycle
			CO3	Anlayse the basic macro-economic concepts and monetary theory
			CO4	Undestand macro- economic concepts to improve their ability to analyse the business climate.
			CO5	Analyse their employability by combining their technical knowledge with appropriate economic models.
			CO6	Attain knowledge of elementary accounting concepts used for preparing balance sheet and interpretation of balance sheets.
	CS231	Data Structures and Algorithms Lab	CO1	Appreciate the importance of structure and abstract data type, and their basic usability in different applications.
			CO2	Analyze and differentiate different algorithms based on their time complexity.
			CO3	Implement linear and non-linear data structures using linked lists.
			CO4	Understand and apply various data structure such as stacks, queues, trees, graphs, etc. to solve various computing problems.
			CO5	Implement various kinds of searching and sorting techniques, and decide when to choose which technique.
			CO6	Identify and use a suitable data structure and algorithm to solve a real world problem.
	CS233	Electronic Circuits lab	CO1	Identify basic electronic components, design and develop electronic circuits.
			CO2	Design and demonstrate functioning of various discrete analog circuits
			CO3	Be familiar with computer simulation of electronic circuits and how to use it proficiently for design and development of electronic circuits.
			CO4	Understand the concepts and their applications in engineering.
			CO5	Communicate effectively the scientific procedures and explanations in formal technical presentations/reports.
S4	MA202	Probability Distributions, Transforms and Numerical Methods	CO1	Acquire the concept of random variable ,discrete probability distributions with practical applications in various engineering and social life situation
			CO2	Acquire the concept of continuous probability distributions with practical applications in various engineering and social life situation.
			CO3	Understand Fourier transforms which has wide applications in all engineering courses.

			CO4	Understand Laplace transforms which has wide applications in all engineering courses
			CO5	Solve various engineering problems using interpolation and iteration.
			CO6	Solve various engineering problems using numeric integration
	CS202	Computer Organization and Architecture	CO1	Identify the basic structure and functional units of a digital computer.
			CO2	Analyse the effect of addressing modes on the execution time of a program
			CO3	Design processing unit using the concepts of ALU and control logic design
			CO4	Identify the pros and cons of different types of control logic design in processors
			CO5	Select appropriate interfacing standards for I/O devices
			CO6	Identify the roles of various functional units of a computer in instruction execution
	CS204	Operating Systems	CO1	Identify the purpose, structure and functions of operating system and system calls.
			CO2	Understand process management and exemplify inter process communication.
			CO3	Illustrate process synchronization problems.
			CO4	Compare various process scheduling algorithms and understand deadlocks.
			CO5	Apply appropriate memory management schemes.
			CO6	Illustrate various disk scheduling algorithms and understand the need of protection in an operating system.
	CS206	Object Oriented Design and Programming	CO1	Apply object oriented principles in software design process.
			CO2	Students can Develop Java programs for real applications using java constructs and libraries.
			CO3	Students can design and develop various object oriented features like inheritance, data abstraction, encapsulation and polymorphism to solve various computing problems using Java language.
			CO4	Able to use Exception Handling in java.
			CO5	Use Graphical user interface and Exception Handling in java.
			CO6	Develop and deploy Applet in java.
	CS208	Principles of Database Design	CO1	Define, explain and illustrate the fundamental concepts of databases.

			CO2	Construct an entity-relationship (E-R) model from specifications and to perform the transformation of the conceptual model into corresponding logical data structures.
			CO3	Develop queries for relational database in the context of practical applications
			CO4	Model and design a relational database following the design principles.
			CO5	Define, explain and illustrate fundamental principles of data organization, query optimization and concurrent transaction processing.
			CO6	Appreciate the latest trends in databases.
	HS210	Life Skills	CO1	The students will be able to Communicate effectively
			CO2	Make effective presentations
			CO3	Write different types of reports.
			CO4	Face interview & group discussion.
			CO5	Critically think on a particular problem.
			CO6	Solve problems.
			CO7	Work in Group & Teams
	CS232	Free and Open Source Software Lab	CO1	Identify and apply various linux commands
			CO2	Develop Shell Scripts and GUI for specific needs
			CO3	Perform basic level application deployment, Kernel configuration and installation.
			CO4	Apply tools like GIT.
	CS234	Digital Systems Lab	CO1	Identify and explain the digital ICs and their use in implementing digital circuits.
			CO2	Design and implement different kinds of digital circuits.
S5	CS301	Theory of Computation	CO1	Design finite state automata models and the equvaence between the modes.
			CO2	Design automata,regular grammar,regular expression and myhill-nerode relation representations for regular languages.
			CO3	Classify formal languages into regular,contex free ,contex sensitive and unrestricted languages.
			CO4	Design push-down automata and context free grammer representations for context free languages.
			CO5	Design Turing Mechine for accepting recursively enumerable languages
			CO6	Understand the notions of decidabiity and undecidability of problems,halting problems
	CS303	System Software	CO1	Distinguish different software into different categories..

			CO2	Design, analyze and implement one pass, two pass or multi pass assembler.
			CO3	Design, analyze and implement loader and linker.
			CO4	Design, analyze and implement macro processors.
			CO5	Critique the features of modern editing /debugging tools.
	CS305	Microprocessors and Microcontrollers	CO1	Describe different modes of operations of a typical microprocessor and microcontroller.
			CO2	Design and develop 8086 assembly language programs using software interrupts and various assembler directives.
			CO3	Interface microprocessors with various external devices.
			CO4	Analyze and compare the features of microprocessors and microcontrollers
			CO5	Design and develop assembly language programs using 8051 microcontroller.
	CS307	Data Communication	CO1	Identify and list the various issues present in the design of a data communication system
			CO2	Apply the time domain and frequency domain concepts of signals in data communication.
			CO3	Compare and select transmission media based on transmission impairments and channel capacit
			CO4	Select and use appropriate signal encoding techniques and multiplexing techniques for a given scenario.
			CO5	Design suitable error detection and error correction algorithms to achieve error free data communication
			CO6	Apply the spread spectrum concepts and various switching techniques used in communication systems
	CS309	Graph Theory and Combinatorics	CO1	Demonstrate the knowledge of fundamental concepts in graph theory, including properties and characterization of graphs and trees.
			CO2	Use graphs for solving real life problems.
			CO3	Distinguish between planar and non-planar graphs and solve problems.
			CO4	Develop efficient algorithms for graph related problems in different domains of engineering and science.
	CS361	Soft Computing(Elective 1)	CO1	Learn about soft computing techniques and their applications.
			CO2	Analyze various neural network architectures.
			CO3	Define the fuzzy systems.
			CO4	Understand the genetic algorithm-based systems and their applications.
			CO5	Identify and select a suitable Soft Computing technology to solve the problem; Construct a solution and implement a Soft Computing solution.
			CO6	Insight into the tools that make up the soft computing technique: fuzzy logic, artificial neural networks and hybrid systems Techniques.

	CS341	Design Project	CO1	Think innovatively on the development of components,products, processes or technologies in the engineering field.
			CO2	Analyze the problem requirements and arrive workable design solutions.
			CO3	To communicate about their innovations and research findings effectively.
			CO4	To introduce students to various modern tools and techniques.
			CO5	Understand the engineering and management principles.
	CS331	System Software Lab	CO1	Compare and analyze CPU Scheduling Algorithms like FCFS, Round Robin, SJF, and Priority.
			CO2	Implement basic memory management schemes like paging.
			CO3	Implement synchronization techniques using semaphores etc.
			CO4	Implement banker's algorithm for deadlock avoidance.
			CO5	Implement memory management schemes and page replacement schemes and file allocation and organization techniques.
			CO6	Implement system software such as loaders, assemblers and macro processor.
	CS333	Application Software Development Lab	CO1	Design and implement a database for a given problem using database design principles.
			CO2	Apply stored programming concepts (PL-SQL) using Cursors and Triggers.
			CO3	Design and implement a database for a given problem using relational algebra concept
			CO4	Apply the concepts views
			CO5	Use graphical user interface, Event Handling and Database connectivity to develop and deploy applications and appl
			CO6	Develop medium-sized project in a team
S6	CS302	Design and Analysis of Algorithms	CO1	To analyze a given algorithm and express its time and space complexities in asymptotic notations.
			CO2	To solve recurrence equations using Iteration method, Recurrence Tree method, Masters theorem.
			CO3	To design algorithm using Divide and Conquer Strategy.
			CO4	To compare Dynamic programming and Divide and Conquer strategies.
			CO5	To solve optimization problems using Greedy strategy.
			CO6	To design efficient algorithms using Back Tracking and Branch Bound techniques for solving problems.
			CO7	To classify computational problems into P,NP,NP-Hard and NP-compete.

	CS304	Compiler Design	CO1	Explain the concepts and different phases of compilation with compile time error handling.
			CO2	Represent language tokens using regular expressions, context free grammar and finite automata and design lexical analyzer for a language.
			CO3	Compare top down with bottom up parsers, and develop appropriate parser to produce parse tree representation of the input.
			CO4	Generate intermediate code for statements in high level language.
			CO5	Design syntax directed translation schemes for a given context free grammar.
			CO6	Apply optimization techniques to intermediate code and generate machine code for high level language program.
	CS306	Computer Networks	CO1	Visualize the different aspects of networks, protocols and network design models.
			CO2	Examine various Data Link layer design issues and Data Link protocols.
			CO3	Examine the important aspects and functions of network layer in internetworking
			CO4	Compare and select appropriate congestion control algorithms for a network
			CO5	Analyze and compare different LAN protocols
			CO6	Understand the functions of transport layer and application layer
	CS308	Software Engineering and Project Management	CO1	Demonstrate an understanding of and apply current theories, models, and techniques that provide a basis for the software lifecycle.
			CO2	analyse a problem and identify and define the computing requirements to the problem.
			CO3	Translate a requirement specification to a design using an appropriate software engineering methodology
			CO4	Formulate appropriate testing strategy for the given software system.
			CO5	Develop software projects based on current technology, by managing resources economically and keethical values.
			CO6	Learn to work as an effective and productive software engineer in a range of professional and social situations.
	HS300	Principles of Management	CO1	Manage people and organisations
			CO2	Critically analyse and evaluate management theories and practices
			CO3	Plan and make decisions for organisations

			CO4	Do staffing and related HRD functions
	CS368	Web Technologies (Elective 2)	CO1	Understand different components in web technology and to know about CGI and CMS
			CO2	Develop interactive Web pages using HTML/XHTML.
			CO3	Present a professional document using Cascaded Style Sheets.
			CO4	Construct websites for user interactions using JavaScript and JQuery.
			CO5	Know the different information interchange formats like XML and JSON.
			CO6	Develop Web applications using PHP.
	CS364	Mobile Computing(Elective 2)	CO1	Students could explain various Mobile Computing application, services and architecture
			CO2	Students should be able to differntiatae the various technology used in the celluar wireless networks.
			CO3	Students must identify the various protocols in the wireless LANS
			CO4	Students are able to describe the concept of Internet Mobile.
			CO5	Student should able to identify the concept of TCP/IP in Mobile computing
			CO6	Students understand the security issues in Mobile Computing.
	CS332	Microprocessor Lab	CO1	Develop assembly language programs for problem solving using software interrupts and various assembler directives.
			CO2	Implement interfacing of various I/O devices to the microprocessor/microcontroller through assembly language programming.
	CS334	Network Programming Lab	CO1	Use network related commands and configuration files in Linux Operating System.
			CO2	Develop operating system and network application programs.
			CO3	Analyze network traffic using network monitoring tools.
	CS352	Comprehensive Exam	CO1	The students will be confident in discussing the fundamental aspects of any engineering problem/situation and give answers in dealing with them
S7	CS401	Computer Graphics	CO1	Analyse various graphics devices

			CO2	Analyze and implement algorithms for line drawing, circle drawing and polygon filling.
			CO3	Apply geometrical transformation on 2D and implement line clipping.
			CO4	Apply geometrical transformation on 3D and implement polygon clipping.
			CO5	Apply various projection techniques on 3D objects and summarize visible surface detection methods.
			CO6	Intrepret various concepts and basic operations of image processing.
	CS403	Programming Paradigms	CO1	Compare scope and binding of names in different programming languages
			CO2	Analyze control flow structures and different control abstraction mechanisms in different programming languages
			CO3	Appraise data types in different programming languages
			CO4	Analyze object oriented constructs in different programming languages
			CO5	Compare different concurrency constructs
			CO6	Interpret the concepts of run- time program management
	CS405	Computer System Architecture	CO1	Summarize different parallel computer models
			CO2	Analyze the advanced processor technologies
			CO3	Interpret memory hierarchy
			CO4	Compare different multiprocessor system interconnecting mechanisms
			CO5	Interpret the mechanisms for enforcing cache coherence
			CO6	Analyze different message passing mechanisms
			CO7	Analyze different pipe lining techniques
			CO8	Appraise concepts of multithreaded and data flow architectures
	CS407	Distributed Computing	CO1	Distinguish distributed computing paradigm from other computing paradigms.
			CO2	Understand the core concepts of distributed systems.
			CO3	Illustrate the mechanisms of inter process communication in distributed system.
			CO4	Apply appropriate distributed system principles in ensuring transparency, consistency and fault-tolerance in distributed file system.
			CO5	Compare the concurrency control mechanisms in distributed transactional environment.
			CO6	Outline the need for mutual exclusion and election algorithms in distributed systems.
	CS409	Cryptography and Network Security.	CO1	Summarize different classical encryption techniques
			CO2	Identify mathematical concepts for different cryptographic algorithms

			CO3	Demonstrate cryptographic algorithms for encryption/key exchange
			CO4	Summarize different authentication and digital signature schemes
			CO5	Identify security issues in network, transport and application layers and outline appropriate security protocols
	CS467	Machine Learning	CO1	Differentiate various learning approaches, and to interpret the concepts of supervised learning
			CO2	Compare the different dimensionality reduction techniques
			CO3	Apply theoretical foundations of decision trees to identify best split and Bayesian classifier to label data points
			CO4	Illustrate the working of classifier models like SVM, Neural Networks and identify classifier model for typical machine learning applications
			CO5	Identify the state sequence and evaluate a sequence emission probability from a given HMM
			CO6	Illustrate and apply clustering algorithms and identify its applicability in real life problems
	CS451	Seminar and Project Priliminary	CO1	Gets good exposure to a domain of interest and the research problems in the domain.
			CO2	Identify a latest concept from the seected area and analyze the core ideas as well as pros and cons.
			CO3	Improves his/her writing and presentation skills.
			CO4	Gets practice in the art of doing literature survey
			CO5	Prepare documentation and thus explain how the selected concept is relevant in current scenario.
	CS431	Compiler Design Lab	CO1	Implement the techniques of Lexical Analysis and Syntax analysis.
			CO2	Apply the knowledge of Lex & Yacc tools to develop programs
			CO3	Generate intermediate code.
			CO4	Implement Optimization techniques and generate machine level code.
S8	CS402	Datamining and Warehousing	CO1	Identify the key process of Data Mining and Warehousing.
			CO2	Identify the key process of data preprocessing.
			CO3	Analyse and compare various classification models.
			CO4	Evaluate the performance of various classification methods using performance metrics.
			CO5	Make use of the concept of association rule mining in real world scenario

			CO6	Select appropriate clustering and algorithms for various applications and extend data mining methods to the new domains of data.
	CS404	Embedded Systems	CO1	Students will be able to demonstrate the role of individual components involved in a typical embedded system
			CO2	Analyze the characteristic of different computing elements and select the most appropriate one for an embedded system.
			CO3	Students will be to model the operation of an embedded system with help of structure and behavioral description.
			CO4	Identify the role of different software modules in the embedded system design.
			CO5	Design a simple task to run in a RTOS environment.
			CO6	Analyze the latest trends in the embedded system design
	CS468	Cloud computing	CO1	Identify the significance of implementing virtualization techniques.
			CO2	Interpret the various cloud computing models and services
			CO3	Compare the various public cloud platforms and software environments.
			CO4	Apply appropriate cloud programming methods to solve big data problems.
			CO5	Appreciate the need of security mechanisms in cloud
			CO6	Illustrate the use of various cloud services available online.
	CS472	Principles of Information Security	CO1	Recognize the common threats faced today.
			CO2	Interpret the foundational theory behind information security.
			CO3	Design a secure system.
			CO4	Identify the potential vulnerabilities in software.
			CO5	Discriminate the relevance of security in various domain.
			CO6	Develop secure web services and perform secure e-transactions.
	CS492	PROJECT	CO1	Apply engineering knowledge in practical problem solving.
			CO2	To foster innovation in design of products , processess or systems.
			CO3	To develop creatve thinking in finding viable solutions to engineering problems.
			CO4	Identify new innovation to overcome existing problems.
			CO5	Prepare documentation and thus explain how the selected concept is relevant in current scenario.