Department of Electronics & Communication Engineering
CO ATTAINMENT
2021-2022

Paper Code (Name)	COs	COURSE OUTCOMES(COs)	Attainment (%)
3RD SEMESTER			
EC301 (Electronic Devices)	**CO1**	Differentiate the conduction techniques in semiconductor materials	75%
	CO2	Analyze characteristics of semiconductor diodes, bipolar transistors, Mos-Transistors and solve problems.	75%
	CO3	Differentiate between different Opto-electronic devices	75%
EC302 (Digital System Design)	**CO1**	Convert various number system and apply logic gates, Boolean algebra and K-Map to design digital circuits.	75%
	CO2	Design the digital combinational circuits likes decoders, encoders, multiplexers and de-multiplexers, half adder, full adder and compare their performance to optimize production cost and also develop sequential digital circuits like flip-flop, register, counter to design memory device.	75%
	CO3	Illustrate the knowledge of ROM,RAM,PROM,PLD,FPGA,TTL,CMOS and ECL apply them to design VLSI system.	75%
EC303 (Signals & Systems)	**CO1**	Analyze different types of signals.	45%
	CO2	Represent continuous and discrete systems in time and frequency domain using different transforms.	45%
	CO3	Investigate whether the system is stable.	45%
	CO4	Sampling and reconstruction of a signal.	45%
EC304 Network Theory	**CO1**	**Apply** all the electrical network theories and the concept of resonance to typical electric circuits with AC & DC sources to solve problems related to electronics & Communication Engineering	67%
	CO2	**Apply** Laplace transform technique to **analyze** complex electrical circuits in s domain and solve for voltage & current values related to electronics & communication Engineering.	67%
	CO3	**Apply** the knowledge of any set of two-port parameters for circuit analysis, & measurement of different parameters and convert one set of two-port parameters to another.	67%
ES-CS301 Data Structure & Algorithm (ES)	**CO1**	Implementation of different data structures efficiently.	75%
	CO2	Usage of well-organized data structures to handle large amount of data.	75%
	CO3	Usage of appropriate data structures for problem solving.	75%

BS-M301 Probability & Statistics(BS)	**CO1**	The students will learn: The ideas of probability and random variables and various discrete and continuous probability distributions and their properties.	78%
	CO2	The basic ideas of statistics including measures of central tendency, correlation and	78%
	CO3	The statistical methods of studying data samples.	78%
EC391 Electronic Devices Lab.)	**CO1**	Organize/Design the experiment related to **Solid State Device Lab.**	81%
	CO2	Generate experimental Data related to **Solid State Device Lab.**	81%
	CO3	Conduct actual experiment related to **Solid State Device Lab.**	81%
	CO4	Analyze data and draw conclusion related to **Solid State Device Lab.**	81%
	CO5	Analyze with proper experimental data and graphs and communicate effectively related to **Solid State Device Lab.**	81%
EC392 Digital System Design	**CO1**	Organize/Design the experiment related to **Digital System Design Lab.**	88%
	CO2	Generate experimental Data related to **Digital System Design Lab.**	88%
	CO3	Conduct actual experiment related to **Digital System Design Lab.**	88%
	CO4	Analyze data and draw conclusion related to **Digital System Design Lab.**	88%
	CO5	Analyze with proper experimental data and graphs and communicate effectively related to **Digital System Design Lab.**	88%
ESCS391 Data Structure Lab	**CO1**	Design and develop programs using data structure & algorithm concepts.	81%
	CO2	Develop simple applications using linear and non-linear data structures & algorithms concepts and understand the access mechanisms and other use and functionalities.	81%
	CO3	Implement searching and sorting concepts for problem solving.	81%
	CO4	Implement the concepts of graph and hashing concepts for problem solving.	81%
4TH SEMESTER			
EC401 Analog Communication	**CO1**	Design system components for amplitude modulation techniques that meet the specified needs with appropriate consideration relevant to complex analog communication systems	78%
	CO2	Analyze system components and calculate the corresponding values for nonlinear communication systems that meet the specified needs with appropriate consideration relevant to complex analog communication systems.	78%
	CO3	Analyze a stereo and a multiplexed system as applied to audio, analog or	78%

		digital communication respectively.	
	CO4	Analyze noise parameters and compare signal to noise ratio for analog modulation techniques reaching substantiated conclusions on the performance of analog communication systems.	78%
EC402 Analog Electronic Circuits	**CO1**	Understand the characteristics of diodes and transistors and design and analyse various rectifier and amplifier circuit.	75%
	CO2	Understand the functioning of OP-AMP and design OP-AMP based circuits, Oscillators and multivibrators.	75%
EC403 Microprocessor & Microcontrollers	**CO1**	Students will be able to do assembly language programming using 8085/8086 and interfacing design of peripherals like I/O, A/D, D/A, Timer etc.	78%
	CO2	Students will be able to distinguish and analyze the properties of microcontroller	78%
ESCS401 Design and Analysis of Algorithm	**CO1**	To analyze and identify the Complexity of a problem and compute the recurrence relation.	75%
	CO2	To analyze the several algorithms design techniques on some certain problems using divide & conquer method, dynamic programming approach, backtracking, greedy method.	75%
	CO3	To understand lower bound theory, graph traversal algorithm, network flow, disjoint set manipulation different method.	75%
	CO4	To design the algorithm of string matching problem, matrix manipulation algorithm.	75%
	CO5	To understand amortize analysis, approximation algorithm, notion of NP-completeness.	75%
BS M401 Numerical Methods	**CO1**	To develop thorough understanding of the mathematical concepts and theories that underlie numerical methods. This includes topics such as interpolation, differentiation, integration, and linear algebra.	74%
	CO2	Students should be able to analyse a given engineering problem and choose the appropriate numerical method to solve it. This requires an understanding of the strengths and limitations of various numerical techniques.	74%
	CO3	Students should be able to write computer programs to implement numerical algorithms. This includes an understanding of programming languages such as MATLAB, Python, or C++.	74%
	CO4	Students should understand the concept of numerical error and the sources of error in numerical calculations. They should be able to perform error analysis and make appropriate adjustments to improve the accuracy of their numerical solutions.	75%
BS B401 Biology for	**CO1**	After studying the course, the student will be able to: Describe how biological observations of 18th Century that lead to major	81%

Engineer		discoveries and Convey that classification per se is not what biology is all about but highlight the underlying criteria, such as morphological, biochemical and ecological	
	CO2	Highlight the concepts of recessiveness and dominance during the passage of genetic material from parent to offspring Convey that all forms of life have the same building blocks and yet the manifestations are as diverse as one can imagine	81%
	CO3	Classify enzymes and distinguish between different mechanisms of enzyme action. Identify DNA as a genetic material in the molecular basis of information transfer.	81%
	CO4	Analyse biological processes at the reductionistic level Apply thermodynamic principles to biological systems.	81%
	CO5	Identify and classify microorganisms.	81%
EC491 Analog Communication Lab	**CO1**	Organize/Design the experiment related to **Analog Communication Lab.**	81.25%
	CO2	Generate experimental Data related to **Analog Communication Lab.**	81.30%
	CO3	Conduct actual experiment related to **Analog Communication Lab.**	82.22%
	CO4	Analyze data and draw conclusion related to **Analog Communication Lab.**	81.48%
	CO5	Analyze with proper experimental data and graphs and communicate effectively related to **Analog Communication Lab.**	81.85%
EC492 Analog Electronic Circuit	**CO1**	Organize/Design the experiment related to **Analog Electronic Circuit Lab.**	83.14%
	CO2	Generate experimental Data related to **Analog Electronic Circuit Lab.**	83.14%
	CO3	Conduct actual experiment related to **Analog Electronic Circuit Lab.**	83.14%
	CO4	Analyze data and draw conclusion related to **Analog Electronic Circuit Lab.**	83.14%
	CO5	Analyze with proper experimental data and graphs and communicate effectively related to **Analog Electronic Circuit Lab.**	83.14%
EC493 Microprocessor & Microcontroller Lab	**CO1**	The knowledge of basic microcomputer system and the architecture as well as assembly language programming of 8085 **Microprocessor** to solve engineering problems related to design system based on these processors in ECE.	93.8%
	CO2	The knowledge of architecture and assembly language programming of 8051 microcontroller and the architecture of PIC to solve engineering problems related to design system based on these processors in ECE	93.7%
	CO3	The knowledge of architecture and assembly language programming of 8086 **Microprocessor** to solve engineering problems related to design system based on these processors in ECE.	93.5%
	CO4	The knowledge of memory and peripheral interfacing devices to solve engineering problems related to design of I/O and memory interfacing of **Microprocessor and Microcontroller Lab** based system in ECE.	93.7%

	CO5	Analyze with proper experimental data communicate effectively related to **Microprocessor and Microcontroller Lab.**	93.8%
BS-M(CS)491 Numerical Method Lab.	**CO1**	Students would develop deep understanding of numerical algorithms, including interpolation, differentiation, integration, and linear algebra, and how these algorithms can be implemented in C.	61%
	CO2	Students would be able to write computer programs in C to implement numerical algorithms. This requires an understanding of the syntax and features of C programming language.	61%
	CO3	Students would develop an understanding of programming concepts such as data structures, control structures, functions, and file handling in C, and how these concepts can be used to implement numerical algorithms.	61%
	CO4	Students would be able to identify and fix errors in C programs, including runtime errors, syntax errors, and logical errors. They should also understand the importance of error handling in numerical computations.	61%
5TH SEMESTER			
EC501 Electromagnetic Waves	**CO1**	Understand the basic mathematical concepts related to electromagnetic vector fields.	70%
	CO2	Characterize uniform plane wave and calculate reflection and transmission of waves at media interface.	70%
	CO3	Understand characteristics and wave propagation on high frequency transmission lines, carryout impedance transformation on transmission line and use sections of transmission line sections for realizing circuit elements.	70%
	CO4	Analyze wave propagation on metallic waveguides in modal form.	70%
	CO5	Understand principle of radiation and radiation characteristics of an antenna.	70%
EC502 Computer Architecture	**CO1**	learn how computers work and know basic principles of computer's Working procedure.	70
	CO2	Analyze the performance of computers.	70
	CO3	Know how computers are designed and built.	70
	CO4	Understand issues affecting modern processors (caches, pipelines etc.)	70
EC503 Digital Communication & Stochastic Process	**CO1**	Apply the fundamental knowledge of probability theory and random processes for the solution of complex engineering problems related to digital communication techniques.	64
	CO2	Analyze signal and system parameters using the methods of vector algebra reaching substantiated conclusions on digital communication techniques.	64
	CO3	Design solution for baseband transmission techniques as applicable to digital communication	64

	CO4	Design solution for digital carrier modulation techniques as applicable to electronics and Communication Engineering	64
EC504 **Digital Signal Processing**	**CO1**	Appling sampling theorem students can able to **construct/convert** continuous time signal/analog into digital sequence and gain the **knowledge** from time to frequency domain conversion like DTFT,DFT.	68%
	CO2	Student can able to **design** and **implement** different types of digital filters(both FIR and IIR) from analog prototype filter using the knowledge of filter transformation(Likely Impulse invariant and Bilinear transform) in different form such as direct form-I, form-II, cascade and parallel etc.	68%
	CO3	They can able to **process** digital signals and can also **design** Digital system/Digital signal Processor by setting proper Algorithm onto FPGA and writing Assembly level program.	68%
PEEC505A Program Elective1 Nano Electronics	**CO1**	Understand various aspects of nano-technology and the processes involved in making nano components and material and appropriate use in solving practical problems	68%
	CO2	Appropriate use of different nano-technology for life-long learning.	68%
EC591 Electromagnetic Wave Lab	**CO1**	Understand the radiation pattern of dipole antenna	83%
	CO2	Understand the radiation pattern of Folded dipole antenna.	83%
	CO3	Understand the radiation pattern of 3 element yagi -uda antenna .	83%
	CO4	Analyze the beam width, gain and radiation pattern of a 3-element,5 element and 7 element yagi- uda antenna.	83%
	CO5	Evaluate the radiation characteristics of a Pyramidal horn antenna	83%
EC592 Digital Communication Lab	**CO1**	Apply the fundamental knowledge of probability theory and random processes for the solution of complex engineering problems related to digital communication techniques.	93%
	CO2	Analyze signal and system parameters using the methods of vector algebra reaching substantiated conclusions on digital communication techniques.	93%
	CO3	Design solution for baseband transmission techniques as applicable to digital communication	93%
	CO4	Design solution for digital carrier modulation techniques as applicable to electronics and Communication Engineering	93%
EC593 Digital Signal Processing Lab.	**CO1**	**Organize/Design** the experiment related to **Digital Signal Processing Lab.**	94.8
	CO2	**Generate** experimental Data related to **Digital Signal Processing Lab.**	94.8
	CO3	**Conduct** actual experiment related to **Digital Signal Processing Lab.**	94.6
	CO4	**Analyze** data and draw conclusion related to **Digital Signal Processing Lab.**	94.9
	CO5	**Analyze** with proper experimental data and graphs and communicate effectively related to **Digital Signal Processing Lab.**	94.8

6TH SEMESTER			
EC601 Control System & Instrumentation	**CO1**	**Characterize** a system and find its steady state behavior.	64%
	CO2	**Investigate** stability of a system using different test related to control system.	64%
EC602 Computer Network	**CO1**	Familarization with the fundamental knowledge of data communication and networks and **apply** this knowledge to **investigate** the error in the communication network and **analyze** the errors using different error correcting codes.	64%
	CO2	**Analyze** the internetworking devices and **investigate** different addressing and subnetting protocols to **investigate** proper process to process delivery.	64%
PEEC603D Information Theory & Coding	**CO1**	Recognize the notion of information in the quantitative sense to measure the quantity of information for transmission of data and apply this basic knowledge to calculate channel capacity and probability distribution for real time transmission systems.	65%
	CO2	Assess the fundamental coding theorem for encoding and decoding the information and develop the different techniques for construction of error correction codes .	65%
	CO3	Evaluate the rate and error probabilities in different coding techniques to implement the cost effective system.	65%
OEEC604C Object Oriented Programming	**CO1**	differentiate between structures oriented programming and object oriented programming.	70%
	CO2	use object oriented programming language like C++ and associated libraries to develop object orientedprograms.	70%
	CO3	understand and apply various object oriented features like inheritance, data abstraction, encapsulation andpolymorphism to solve various computing problems using C++ language.	70%
	CO4	apply concepts of operator-overloading, constructors and destructors	70%
	CO5	apply exception handling and use built-in classes from STL.	70%
EC691 Control System & Instrumentation Lab.	**CO1**	**Characterize** a system and investigate stability of the system in time and frequency domain with different method related to **Control and Instrumentation Lab.**	90%
	CO2	**Design** various controllers related to **Control and Instrumentation Lab.**	90%
	CO3	**Conduct** experimental set up with CRO ,Instrumentation Amplifier knowing their functional details related to **Control and Instrumentation Lab.**	90%
	CO4	**Conduct** actual experiment related to **Control System and Instrumentation Lab.**	90%
	CO5	**Analyze** with proper experimental data and graphs and communicate effectively related to **Control System and Instrumentation Lab.**	90%
EC692 Computer Network	**CO1**	Understand the basic concept related to NIC installation and configuration. Apply the knowledge of IPC message queue.	95%
	CO2	Remembering and understanding the networking cables, switches, hubs and	95%

Lab		connectors.	
	CO3	Understand multicast and broadcast socket and analyze TCP/UDP socket programming.	95%
	CO4	Applying the knowledge of socket programming, analyze prototype multithreaded server.	95%
	CO5	Understand the knowledge of data link layer flow control mechanism and apply this knowledge for the error control.	95%
EC681 Electronic Design Mini Project Lab	**CO1**	Formulation of a problem statement either from rigorous literature survey or from the requirements raised need to be analysed.	90%
	CO2	Design, implement and test the photo type/algorithm in order to solve the problem statement.	90%
	CO3	Write comprehensive report on Mini Project work.	90%
7TH SEMESTER			
EC701B Satellite Communication	**CO1**	Visualize the architecture of satellite systems as a means of high speed, high range communication system.	73%
	CO2	State various aspects related to satellite systems such as orbital equations, sub-systems in a satellite, link budget, modulation and multiple access schemes.	73%
	CO3	Solve numerical problems related to orbital motion and design of link budget for the given parameters and conditions.	73%
EC702C Neural Network and Fuzzy Logic Control	**CO1**	Analyze and classify neural networks and its implementation algorithms.	71%
	CO2	Apply suitable algorithms on different cases.	71%
	CO3	Apply fuzzy logic and neural networks.	71%
	CO4	Analyze the applications of Neural Network and Fuzzy logic in image processing.	71%
EC703A Embeded System	**CO1**	Understand the internal structure, purpose and application of Embedded system.	74%
	CO2	Apply the concept of Embedded firmware in design of Embedded System.	74%
OEEC704A Web Technology	**CO1**	design good web pages using different tags, tables, forms, frames and style sheets supported by HTML and implement, compile, test and run Java programs, comprising more than one class, to address a particular software problem.	73%
	CO2	demonstrate the ability to employ various types of selection statements and iteration statements in a Java program.	73%
	CO3	be able to leverage the object-oriented features of Java language using abstract class and interface.	73%
	CO4	be able to handle errors in the program using exception handling techniques of Java.	73%
	CO5	design applets as per the requirements with event handling facility.	73%
EC781 Industrial Training & Project	**CO1**	Apply knowledge(fundamental & specialized) to understand the real life problem in the related field.	**90**
	CO2	Understand the design and implementation aspects of engineering	**73**

OEEC704A		system/components.	
	CO3	Work individually and also in a group.	**73**
	CO4	Communicate the details of training through Training Report, Presentation and Viva-Voce.	**73**
	CO5	Understand implication of engineering solutions in social and environmental perspective.	**73**
EC782 Project Stage 1	**CO1**	Formulate the problem.	**92**
	CO2	Develop or design a solution of the problem.	**92**
	CO3	Build up project prototype or model in hardware or software.	**92**
	CO4	Analyze the experimental/collected data.	**92**
	CO5	Do investigation/research in the problem area.	**92**
	CO6	Apply fundamental and specialize knowledge in the area of the problem.	**92**
	CO7	Self learn new methods, tools and techniques.	**92**
	CO8	Apply modern tools and techniques.	**92**
	CO9	Work individually and also in team.	**92**
	CO10	Communicate the details and findings of the project through project report, presentation, Viva-Voce and paper presentation , if any.	**92**
	CO11	Apply project management and economic knowledge	**92**
	CO12	Identify implications of the project in society and environment.	**92**
8TH SEMESTER			
PEEC 801B Fibre Optics Communication	**CO1**	**Learn** the properties of light in different medium and **utilize** the knowledge in different types of fibres for optical fibre communication system, and also the corresponding losses of each kinds of fibres.	**83**
	CO2	**Learn** the working of all types of optical source and detectors for signal modulation and demodulation respectively.	**83**
PEEC802C	**CO1**	Understand the practical situations where mixed signal analysis is required.	**74**
	CO2	Analyze and handle the inter-conversions between signals.	**74**
	CO3	Design systems involving mixed signals.	**74**
OEEC804C	**CO1**	Understand the modern view of AI as the study of agents that receive precepts' from the environment and perform actions.	**75**
	CO2	Demonstrate awareness of the major challenges facing AI and the complex of typical problems within the field.	**75**

	CO3	Exhibit strong familiarity with a number of important AI techniques, including in particular search, knowledge representation, planning and constraint management.	**75**
	CO4	Asses critically the techniques presented and to apply them to real world problems.	**75**
EC881 Project II	**CO1**	Formulate the problem.	**95**
	CO2	Develop or design a solution of the problem.	**95**
	CO3	Build up project prototype or model in hardware or software.	**95**
	CO4	Analyze the experimental/collected data.	**95**
	CO5	Do investigation/research in the problem area.	**95**
	CO6	Apply fundamental and specialize knowledge in the area of the problem.	**95**
	CO7	Self learn new methods, tools and techniques.	**95**
	CO8	Apply modern tools and techniques.	**95**
	CO9	Work individually and also in team.	**95**
	CO10	Communicate the details and findings of the project through project report, presentation, Viva-Voce and paper presentation , if any.	**95**
	CO11	Apply project management and economic knowledge	**95**
	CO12	Identify implications of the project in society and environment.	**95**
EC882 Grand Viva	**CO1**	Demonstrate the capability to formulate the problem.	**95**
	CO2	Demonstrate the capability to develop or design a solution of the problem.	**95**
	CO3	Demonstrate the capability to build up project prototype or model in hardware or software.	**95**
	CO4	Demonstrate the capability to analyze the experimental/collected data.	**95**
	CO5	Show the capability to demonstrate the research based knowledge	**95**
	CO6	Demonstrate the capability to apply fundamental and specialize knowledge in the area of the problem.	**95**
	CO7	Demonstrate the capability for self learning new methods, tools and techniques.	**95**
	CO8	Demonstrate the capability to apply modern tools and techniques.	**95**
	CO9	Demonstrate the capability to work individually and also in team.	**95**
	CO10	Demonstrate the capability to communicate in details and present a topic related to Electronics & Communication Engineering.	**95**

CALCUTTA INSTITUTE OF ENGINEERING AND MANAGEMENT
DEPARTMENT OF INFORMATION TECHNOLOGY
CO ATTAINMENT REPORT
2021-2022

FIRST SEMESTER			
PAPER CODE (Name)	**CO No.**	**Course Outcomes**	**Attained ()**
BS PH-101 (Physics-1)	**CO1**	Apply the knowledge of simple harmonic motion (ideal and real cases) and basic concepts of Mechanics for the solution of complex problems.	81
	CO2	Utilize the knowledge of vector calculus and different coordinate system for the solution of complex problems.	72
	CO3	Apply the knowledge of physical optics (interference, diffraction, polarization) and LASER to solve different complex problems	75
	CO4	Apply the knowledge of dielectric and magnetic properties of materials to interpret different complex systems.	83
	CO5	Utilize the knowledge of Quantum Physics to analyze a complex engineering problem.	69
	CO6	Apply the knowledge statistical mechanics to solve complex problems.	79
BS-M(101) (Mathematics I(A))	**CO1**	To understand the concept and techniques of differential and integral calculus.	75
	CO2	To understand the domain of application of MVT,to engineers problem.	90
	CO3	To learn the concept of eigen values , eigen vectors,diagonalisation	72
ES-EE101 (Basic Electrical Engineering)	CO 1	To understand and analyze basic electric and magnetic circuits.	70
	CO 2	To study the working principles of electrical machines and power converters.	75
	CO 3	To introduce the components of low voltage electrical installations.	70
BS PH-191 (Physics-I Laboratory)	CO1	Organize/design the experiment related to various systems and interpret the physical properties of material.	72
	CO2	Generate experimental Data related to electrical and magnetic properties.	80

	CO3	Conduct actual experiment related to optical phenomena.	78
	CO4	Analyze data and draw conclusion related to quantum physics.	85
	CO5	Analyze with proper experimental data and graphs and communicate effectively.	75
ES-EE 191 (Basic Electrical Engineering Laboratory)	**C0 1**	Gather knowledge about the safety precautions and the do's-don'ts while dealing with electrical equipments.	75
	CO 2	Study about the different electrical instruments and devices through their input-output relationship.	65
	CO 3	Organize different electrical instruments like ammeter, voltmeter, wattmeter and different electrical devices like transformer, rheostat, etc. to observe the output through incandescent lamps.	70
ES ME 192 (Workshop /Manufacturing Practices)	CO1	Utilize the concept of fitting shop and make typical jobs.	70
	CO2	Learn the basics of carpentry shop and utilize the concept to make typical jobs.	70
	CO3	Develop the concept of various machining processes and make use of Lathe, Shaping and Milling machine to construct typical jobs.	65
	CO4	Develop the concept of metal joining process and utilize the concept of welding to join to metal plates.	70

THIRD SEMESTER			
PAPER CODE (Name)	**CO No.**	**Course Outcomes**	**Attained(%)**
ESC301 (Analog & Digital Electronics)	**CO1**	Convert various number system and apply logic gates, Boolean algebra and K-Map to design digital circuits.	60
	CO2	Design the digital combinational circuits likes decoders,encoders,multiplexers amd de-multiplexers, half adder, full adder and compare their performance to optimize production cost and also develop sequential digital circuits like flip-flop, register, counter to design memory device.	62
	CO3	Design and analyse various amplifier circuit, multivibrators, ROM, RAM, FPGA,TTL,CMOS and ECL	55

PCC-CS301 (Data Structure & Algorithm)	CO1	Differentiate how the choices of data structure & algorithm methods impact the performance of program	79
	CO2	Solve problems based upon different data structure & also write programs	83
	CO3	Identify appropriate data structure & algorithmic methods in solving problem	80
	CO4	Discuss the computational efficiency of the principal algorithms for sorting, searching, and hashing.	82
	CO5	Compare and contrast the benefits of dynamic and static data structures implementations	71
PCC CS-302 (Computer Organization)	CO1	Analyze the relevance of classical and modern problems of computer design and construct machine code instructions.	70
	CO2	Design logical expressions and corresponding integrated logic circuits for a variety of problems including the basic components of a CPU such as adders, multiplexers, ALU using fixed-point and floating-point addition, subtraction, multiplication & division algorithm.	75
	CO3	Analyze hierarchical memory system including cache memories and virtual memory and Calculate their Cost, Speed and Capacity.	70
	CO4	Apply the knowledge of various micro-programmed instructions using the concept of pipelining for designing Control Unit and accessing I/O operation.	65
BSC-301 (Mathematics – III(Differential Calculus))	CO1	Express a logic sentence in terms of predicates,quantifiers,and logical connectives	70
	CO2	Apply the rules of interference and proof by contradiction,mathematical induction.	72
	CO3	Use tree and graph algorithm to solve the problems.	75
	CO4	Apply Boolean function ,and simplify expression	70
	CO5	To apply Boolean algebra to solve engineering problems	74
HSMC 301 (Economics for Engineers(Humanities -II))	CO1	Student will able to analyze the economic decisions making, engineering costs & estimation and classification of costs by applying the knowledge of estimating models. Student will develop an understanding of cash flow, rate of return analysis in different socio-environmental situations.	58

	CO2	Analysis of inflation and price change will be done to the students for their proper understanding of the price indexes in economic analysis. Effect of inflation & deflation is analyzed to them to remember and if required to apply in real-life scenarios.	59
	CO3	Illustration of types of property, depreciation and expenses and its impact on business, for better understanding of the business environment and apply the knowledge of it.	61
ESC391 (Analog & Digital Electronics)	CO1	Organize/design the experiment related to analog electronic circuit lab.	70
	CO2	Design the digital combinational circuits likes decoders,encoders,multiplexers amd de-multiplexers, half adder, full adder and compare their performance to optimize production cost.	65
	CO3	Develop sequential digital circuits like Flip-Flop, Registers, Counters to design memory devices.	70
PCC-CS391 (Data Structure & Algorithms)	CO1	Apply the knowledge of linear data structure to implement Linked list, Stack, Queue, Array.	85
	CO2	Apply the knowledge of nonlinear data structure to implement different types of tree.	80
	CO3	Implement different types of searching and sorting techniques in data structure.	82
PCC CS-392 (Computer Organisation)	CO1	Analyze the behaviour of logic gates	80
	CO2	Design combinational circuits for basic components of computer system and applications.	80
	CO3	Design arithmetic circuit for computer system.	80
	CO4	Design Arithmetic logic units and different types of memory blocks.	80
PCC-CS393 (IT Workshop (Sci Lab/ MATLAB/ Python/ R))	CO1	To master an understanding of scripting & the contributions of scripting languages	83
	CO2	Design real life problems and think creatively about solutions	85
	CO3	Apply a solution in a program using Python.	82
	CO4	To be exposed to advanced applications of mathematics, engineering and natural sciences to program real life problems.	74

FIFTH SEMESTER 2022			
ESC-501 (Software Engineering)	CO1	Understand basic SW engineering methods and practices, and their appropriate application.	85
	CO2	Understand u of software process models such as the waterfall and evolutionary models.	80
	CO3	Students will be able perform various life cycle activities like Analysis, Design, Implementation, Testing and Maintenance.	90
	CO4	Students will be able to know various processes used in all the phases of the product.	70
	CO5	Students can apply the knowledge, techniques, and skills in the development of a software product.	65
PCC-CS501 (Compiler Design)	CO1	Understand given grammar specification develop the lexical analyser	90
	CO2	Design a given parser specification design top-down and bottom-up parsers	85
	CO3	Develop syntax directed translation schemes	80
	CO4	Develop algorithms to generate code for a target machine	75
PCC-CS502 (Operating Systems)	CO1	Analyse processes and threads.	60
	CO2	Develop algorithms for process scheduling for a given specification of CPU utilization, Throughput, Turnaround Time, Waiting Time, Response time.	70
	CO3	Formulate a given specification of memory organization develop the techniques for optimally allocating memory to processes by increasing memory utilization and for improving the access time. Design and implement file management system.	65
	CO4	Categorize a given I/O devices and OS (specify) develop the I/O management functions in OS as part of a uniform device abstraction by performing operations for synchronization between CPU and I/O controllers.	60
PCC-CS503 (Object Oriented Programming)	CO1	Understand Abstract Data Types and their implementations using abstraction functions to document them.	70

	CO2	Apply the features of object-oriented design to implement encapsulation, polymorphism, inheritance, and composition of systems based on object identity.	80
	CO3	Name and apply some common object-oriented design patterns and give examples of their use.	65
	CO4	Design applications with an event-driven graphical user interface.	80
HSMC 501 (Introduction to Industrial Management (Humanities – III))	CO1	Student will able to analyze the organisation structure , organizational culture and climate by applying the knowledge of factors affecting them.	59
	CO2	Analysis of determination of critical path on network will be done to the students for their proper understanding of determination of floats, material management, storekeeping- functions.	61
	CO3	Illustration of production planning and control, value analysis and its impact on business, for better understanding of the recent trends in IM and apply the knowledge of it.	62
PEC-IT501B (Artificial Intelligence)	CO1	Apply the good programming skills to formulate the solutions for computational problems.	60
	CO2	Design and develop solutions for informed and uninformed search problems in AI.	70
	CO3	Demonstrate and enrich knowledge to select and apply AI tools to synthesize information and develop models within constraints of application area.	75
	CO4	Develop a minor project in multidisciplinary areas to demonstrate team work through reports and presentation.	70
	CO5	To design and develop an Expert System that operates in a realistic problem domain and communicate effectively in a team or individual and prepare reports.	60
PEC-IT501C (Advanced Computer Architecture)	CO1	Demonstrate concepts of parallelism in hardware/software.	70
	CO2	Discuss memory organization and mapping techniques.	85
	CO3	Describe architectural features of advanced processors.	75

	CO4	Interpret performance of different pipelined processors.	70
	CO5	Development of software to solve computationally intensive problems	65
MC-CS501 (Constitution of India)	CO1	To be able to identify the fundamental rights and duties, Directive Principles of State Policy in the Constitution of India by assessing the functions of various governmental administrations (Centre & State) and the Election Commission	72
ESC-591 (Software Engineering)	CO1	To understand the software engineering methodologies involved in the phases for project development.	85
	CO2	To gain knowledge about open-source tools used for implementing software engineering methods.	90
	CO3	To exercise developing product-startups implementing software engineering methods.	60
	CO4	Learn simple optimization techniques.	75
PCC-CS592 (Operating Systems)	CO1	Design and solve complex UNIX programs.	60
	CO2	Apply the knowledge of process and threads.	70
	CO3	Design and formulate inter process communication through programming.	65
PCC-CS593 (Object Oriented Programming)	CO1	Implement features of object-oriented design such as encapsulation, polymorphism, inheritance, abstraction.	93
	CO2	Implementing multithreading concept in object oriented programming.	92
	CO3	Design applications with an event-driven graphical user interface.	95

SEVENTH SEMESTER 2022			
PEC-IT701C (Cloud Computing)	CO1	Explain the core concepts of the cloud computing paradigm, Cloud classification, Characteristics of Cloud Computing, different cloud models	85
	CO2	Discuss concepts of Abstraction and Virtualization technologies, Load Balancing, Hypervisors, compare different service models	75

	CO3	Lifecycle management of cloud services, Concepts of Cloud Security	65
	CO4	Discuss basic concept of Service Oriented Architecture, Applications in the Cloud, Cloud-based Storage	70
PEC-IT702A (Multimedia Technology)	CO1	Apply the knowledge of the diverse functions of Multimedia systems and its related hardware and software for the solution of problem related to Information Technology.	77
	CO2	Apply the knowledge of text, audio, image and video file formats for enhancement of the text, audio, image and video with using text, audio, image and video processing tools for the solution of a complex problem related to text, audio, image and video in the field of Information Technology.	76.
	CO3	Able to use various types of multimedia data storage devices for storage & retrieval of multimedia data.	73
	CO4	Design different types of multimedia applications like video-on-demand, video conferencing, digital libraries and other industrial applications.	72
OEC-IT701C (Soft Skill & Interpersonal Communication)	CO1	Students will be able to define the significance of soft skills by recalling relevant terminology and concepts from the syllabus, as assessed by a multiple-choice examination.	83
	CO2	Students will be able to evaluate their own beliefs, values, and attitudes in order to set goals and engage in self-discovery activities, as demonstrated by a written reflection essay.	81
	CO3	Students will be able to apply strategies for developing positive thinking, driving out negativity, and enhancing motivation levels in order to achieve personal and professional goals, as demonstrated through a group project and presentation.	74
	CO4	Students will be able to create and communicate effective messages and interpersonal relationships in a corporate context, as demonstrated by a formal report and presentation on a business scenario.	68

HSMC 701 (Project Management and Entrepreneurship)	CO1	Student will able to analyze the concept of innovation and entrepreneurship, contributions of entrepreneurs to the society, risk-opportunities perspective by applying the knowledge of factors affecting them.	58
	CO2	Analysis of project management, issues and problems in project management, project life cycle - initiation / conceptualization phase, determination of project feasibility studies will be done to the students for their proper understanding of social cost benefit analysis.	59
	CO3	Identification and illustration of the critical path and its significance, types of floats and slacks and its impact on business, for better understanding of the recent trends and apply the knowledge of it.	60
PROJ-IT 781 (Project - II)	CO1	To survey the literature; Identify and classify the requirements for the solution of complex engineering problems.	77
	CO2	To define the requirements of the project by proper analysis and interpretation of data and processes supported by standard documentation.	78
	CO3	To analyze the processes by mapping requirements in to Use case diagram(s)/ Data Flow Diagram(s)/ Algorithm(s)/ User-Interface design/ Entity Relationship Diagram(s) etc.	80
	CO4	To design behaviour of the application with modular programming and program flowchart/ class diagrams and sequence diagrams, etc.,following standard guidelines.	81
	CO5	To estimate project metrics like size, effort and cost , reliability and quality, etc and plan project development schedule using PART and GNATT charts.	82
	CO6	To justify the project work with technical documentation, presentation, and discussions as a group to share knowledge.	82

SECOND SEMESTER			
PAPER CODE (Name)	**CO No.**	**Course Outcomes**	**Attained (%)**

BS CH-201 (CHEMISTRY-I)	**CO1**	Analyse microscopic chemistry in terms of atomic and molecular orbitals and intermolecular forces to solve different engineering problems.	69
	CO2	Rationalise bulk properties and processes using thermodynamic consideration for various engineering applications.	72
	CO3	Distinguish the ranges of the electromagnetic spectrum used for exciting different molecular energy levels in various spectroscopic techniques.	78
	CO4	Rationalise periodic properties (ionization potential, electro negativity, oxidation states) for various engineering applications.	81
	CO5	Apply the knowledge of structure, stability and reactivity of organic molecular species in order to gain a clear insight into the mechanism of chemical and biochemical reacting systems used in various engineering problems.	82
BS-M201 (Mathematics-IIA)	**CO1**	To understand the concept of basic probability,including sample spaces,events,probability distribution,and conditional probability.	90
	CO2	Apply probability theory and statistical interference to solve engineering problems.	75
	CO3	Use statistical software and tools to analyze the data.	70
	CO4	Able to communicate their findings and results through written reports,and visual display	85
ES-CS201 (PROGRAMMING FOR PROBLEM SOLVING)	**CO1**	Design Algorithm, flow chart and program in C.	70
	CO2	Apply logical operators and loops in programming.	60
	CO3	Construct arrays using the concept of C programming.	70
	CO4	Analyze how to use arguments and return values and variables from a function.	65
	CO5	Use pointers for direct memory access and manipulation in C; and how to change the memory address contained within a pointer;	70
	CO6	Apply the programming concepts for manipulating strings in C and file handling.	60
HM-HU201 (ENGLISH)	**CO1**	To be able to **use** the correct vocabulary in order to express oneself in English properly	62
	CO2	To be able to **identify** common errors in terms of grammar and choice of words in English	58

	CO3	To be able to **describe**, **discuss**, and **interpret** reading input in English	75
	CO4	To be able to **demonstrate** that one can express oneself in English through writing	64
BS CH-291 (CHEMISTRY-I)	**CO1**	Organize/Design the experiment related to Chemical Science as applicable in various Engineering problems.	72
	CO2	Generate experimental Data related to Chemical Science as applicable in complex problems.	78
	CO3	Conduct actual experiment related to Chemical Science as applicable in different engineering application.	83
	CO4	Analyze data and draw conclusion related to Chemical Science as applicable in various engineering problems.	76
	CO5	Analyze with proper experimental data and graphs and communicate effectively related to Chemical Science as applicable in different engineering fields.	84
ES-CS291 (PROGRAMMING FOR PROBLEM SOLVING)	**CO1**	To formulate the algorithms for simple problems	90
	CO2	To translate given algorithms to a working and correct program	90
	CO3	To be able to correct syntax errors as reported by the compilers	80
	CO4	To be able to identify and correct logical errors encountered at run time	85
	CO5	To be able to write iterative as well as recursive programs	90
	CO6	To be able to represent data in arrays, strings and structures and manipulate them through a program	80
	CO7	To be able to declare pointers of different types and use them in defining self-referential structures.	75
	CO8	To be able to create, read and write to and from simple text files	80
ES-ME291 (Engineering Graphics & Design)	**CO1**	Develop basic knowledge of engineering drawing including lettering, dimensioning and scaling system.	75
	CO2	Develop basic knowledge on geometrical constructions and curves and apply the knowledge to solve real life problems.	70
	CO3	Learn the basic concept of orthographic and isometric projections related to design of engineering.	65

	CO4	Comprehend the basic knowledge of development of different types of surfaces and analyse their real-life applications.	65
HM-HU291 (LANGUAGE LABORATORY)	**CO1**	To be able to **describe, discuss**, and **interpret** the listening input in English	55
	CO2	To be able to **demonstrate** that one can express oneself in English through speaking	54
	CO3	To be able to **describe, discuss,** and **interpret** reading input in English	77
	CO4	To be able to **demonstrate** that one can express oneself in English through writing	67
FOURTH SEMESTER			
PAPER CODE (Name)	**CO No.**	**Course Outcomes**	**Attained (%)**
PCC-CS401 (DISCRETE MATHEMATICS)	**CO1**	To understand the basic concept of set,relation ,mapping	75
	CO2	To understand the POSET,Lattice	80
	CO3	To understand the basic concept of number theory.	75
	CO4	To understand graphs,cycle,trail,path	80
	CO5	To apply the graph colouring,chromatic number to solve engineering problems.	75
PCC-CS 402 (COMPUTER ARCHITECTURE)	**CO1**	To learn the basics of stored program concepts.	75
	CO2	To learn the principles of pipelining	85
	CO3	To learn mechanism of data storage	80
	CO4	To distinguish between the concepts of serial, parallel, pipeline architecture	70
PCC-CS403 FORMAL LANGUAGE AND AUTOMATA THEORY	**CO1**	Familiarize with formal notation for strings, languages and machines and Design finite automata to accept a set of strings of a language.	70
	CO2	Design hierarchy of formal languages, grammars and machines and Determine whether the given language is regular or not	65
	CO3	Design context free grammars to generate strings of context free language and Determine equivalence of languages accepted by Push Down Automata and languages generated by context free grammars	75
	CO4	Distinguish between computability and non-computability and Decidability and undecidability	65
PCC-CS404 DESIGN &	**CO1**	For a given algorithms analyse worst-case running times of algorithms based on asymptotic analysis and justify the correctness of algorithms.	85
	CO2	Describe the greedy paradigm and explain when an algorithmic design situation calls for it. For a given problem develop the greedy algorithms.	75
	CO3	Describe the divide-and-conquer paradigm and explain	70

ANALYSIS ALGORITHM,		when an algorithmic design situation calls for it. Synthesize divide-and-conquer algorithms. Derive and solve recurrence relation.	
	CO4	Describe the dynamic-programming paradigm and explain when an algorithmic design situation calls for it. For a given problems of dynamic-programming.	80
	CO5	Develop the dynamic programming algorithms, and analyse it to determine its computational complexity.	85
	CO6	For a given model engineering problem model it using graph and write the corresponding algorithm to solve the problems.	70
	CO7	Explain the ways to analyse randomized algorithms (expected running time, probability of error).	70
	CO8	Explain what an approximation algorithm is. Compute the approximation factor of an approximation algorithm (PTAS and FPTAS).	65
BSC 401 (BIOLOGY)	**CO1**	Describe how biological observations of 18th century lead to major discoveries and understand that the classification of organisms is based on morphological, biochemical or ecological parameters.	82%
	CO2	Highlight the concepts of recessiveness and dominance during the passage of genetic material from parent to offering.	81%
	CO3	Convey that all forms of life have the same building blocks and yet the manifestations are diverse.	78%
	CO4	Classify enzymes and distinguish between different mechanisms of enzyme action and identify DNA as a genetic material in the molecular basis of information transfer.	83%
	CO5	Analyse biological processes at the reductionistic level and apply thermodynamic principals to the biological systems.	75%
	CO6	Identify and classify microorganisms.	79%
MC 401 (ENVIRONMENTAL SCIENCES)	**CO1**	To apply the knowledge of air pollution in order to develop improved technologies to reduce the adverse effect of pollution on human health and environment.	80
	CO2	To apply the knowledge of water pollution in order to develop improved technologies for controlling water pollution and provide safe and clean drinking water to the society.	82
	CO3	To apply the knowledge of solid waste management in order to develop technologies for reducing, reusing and recycling the waste for the benefit of the society.	84
	CO4	To apply the knowledge of ecology for understanding the	80

		complex interrelationships between the biotic and abiotic components in different types of eco systems in order to ensure sustainable development and growth.	
	CO5	To identify and solve problems related to noise pollution and create awareness among people about its harmful effects and control measures.	88
	CO6	To foster greater community involvement and create social awareness about the important national and international legislations and protocols concerning the protection and conservation of environment.	89
PCC-CS 492 (COMPUTER ARCHITECTURE)	**CO1**	Practical experience on Xlinx	95
	CO2	Analyze the operational behaviour and applications of various gates, sequential and combinational circuits.	85
PCC-CS494 (DESIGN & ANALYSIS ALGORITHM)	**CO1**	Implement Divide and Conquer programming method with different examples	85
	CO2	Demonstrate Brunch and Bound programming method with different example	70
	CO3	Execute Backtracking programming method with different examples	70
	CO4	Demonstrate Greedy programming method with different examples	75
	CO5	Implement Graph Traversal Algorithm with different examples	60

SIXTH SEMESTER			
PAPER CODE (Name)	**CO No.**	**Course Outcomes**	**Attained (%)**
PCC-CS601 (DATABASE MANAGEMENT SYSTEMS)	CO1	Apply the knowledge of pure query language to write a query in relational algebra, relational calculus and construct the SQL queries for Open source and Commercial DBMS like MYSQL, ORACLE, and DB2. .	80
	CO2	Apply the knowledge of entity relationship models to design the database for a given requirement specification.	75
	CO3	Apply the knowledge of query optimization algorithms to optimize the execution time of	70

		a query.	
	CO4	Apply the knowledge of reducing anomalies during database design.	75
	CO5	Understand the transaction atomicity, consistency, isolation, durability for a given transaction-processing system and implement the isolation property based on concurrency control and serializability of scheduling.	70
	CO6	Understand different processes to secure the database.	65
PCC-CS602 (COMPUTER NETWORKS)	CO1	Illustrate of modern network architectures from a design and performance perspective.	70
	CO2	Justify the major concepts involved in wide-area networks (WANs), local area networks (LANs) and Wireless LANs (WLANs).	70
	CO3	Derive Topologies for the enhancement of OSI/ TCP IP protocol suite.	75
PEC-IT601 D (IMAGE PROCESSING)	**CO1**	Explain the fundamentals of digital image and its processing.	70
	CO2	Perform image enhancement techniques in spatial and frequency domain.	72
	CO3	Elucidate the mathematical modelling of image restoration and compression.	80
	CO4	Apply the concept of image segmentation.	60
	CO5	Describe object detection and recognition techniques.	75
PEC-IT602D (PATTERN RECOGNITION)	CO1	Explain and compare a variety of pattern classification, structural pattern recognition and pattern classifier combination techniques.	60
	CO2	Summarize, analyze, and relate research in the pattern recognition area verbally and in writing.	70
	CO3	Apply performance evaluation methods for pattern and critique comparisons of techniques made in the research literature.	75
	CO4	Apply pattern recognition techniques to real-world problems such as document analysis and recognition.	70
	CO5	Implement simple pattern classifiers, classifier combinations and structural pattern recognizers.	60
OEC-IT601B (HUMAN RESOURCE DEVELOPMENT AND ORGANIZATIONAL BEHAVIOR)	CO1	Critically assess existing theory and practice in the field of HRM.	75
	CO2	Develop an ability to undertake qualitative and quantitative research.	60
	CO3	Apply knowledge about qualitative and quantitative research to an independently constructed piece of work.	70
	CO4	Respond positively to problems in unfamiliar contexts.	75
	CO5	Identify and apply new ideas, methods	60

		and way of thinking.	
	CO6	Demonstrate competence in communicating and exchanging ideas in a group context.	60
PROJ - CS601 (RESEARCH METHODOLOGY)	CO1	Understand research problem formulation.	78
	CO2	Analyze research related information	82
	CO3	Follow research ethics	67
	CO4	Understand that today's world is controlled by Computer, Information Technology, but tomorrow's world will be ruled by ideas, concepts, and creativity.	79
	CO5	Understanding that when IPR would take such an important place in the growth of individuals & nations, it is needless to emphasize the need for information about Intellectual Property rights to be promoted among students in general & engineering in particular.	75
	CO6	Understanding that IPR protection provides an incentive to inventors for further research work and investment in R & D, which leads to creation of new and better products, and in turn brings about economic growth and social benefits.	85
PCC-CS691 (DATABASE MANAGEMENT SYSTEMS)	CO1	Apply the knowledge of pure query language to write a query in relational algebra, relational calculus and construct the SQL queries for Open source and Commercial DBMS like MYSQL, ORACLE, and DB2. .	80
	CO2	Apply the knowledge of entity relationship models to design the database for a given requirement specification.	75
	CO3	Apply the knowledge of query optimization algorithms to optimize the execution time of a query.	70
	CO4	Apply the knowledge of reducing anomalies during database design.	75
	CO5	Understand the transaction atomicity, consistency, isolation, durability for a given transaction-processing system and implement the isolation property based on concurrency control and serializability of scheduling.	70
	CO6	Understand different processes to secure the database.	65
	CO1	Understand the structure and	90

PCC-CS692 (COMPUTER NETWORKS)		organization of computer networks; including the division into network layers, role of each layer, and relationships between the layers, various network command, and network device.	
	CO2	Understand IPAddressing, Subnetting.	90
	CO3	Understand of transport layer concepts and protocol design; including connection oriented and connection-less models, techniques to provide reliable data delivery and algorithms for congestion control and flow control.	90
	CO4	Understand of Application layer concepts and protocol design.	80

MBA Department
CO ATTAINMENT
2021-2022

Subject Code & Subject Name	COs	Attainment
MB 101 Managerial Economics (Micro)	CO1:To explain and demonstrate the different types of markets and features – Price determination under different markets along with concepts like Law of Variable Proportions and Returns to S Producers equilibrium with the help of Isoquants, Expansion path Elasticity of Substitution.	83%
	CO2: To acquire knowledge and develop ideas of these concepts in detail and analyse the applicability in real life situations.	85%
MB 102 ORGANIZATIONAL BEHAVIOUR	CO1: The student will be able to evaluate and analyse the various facets of organisationbehaviour including personality, perception, and attitude and job satisfaction.	92%
	CO2 : The student will be able to understand the various organisation theories and analyse group behaviour, conflict, change and leadership concepts.	83%
MB 103 Business Communication	CO 1 To demonstratecompetenceinverbalbusinesscommunication &"ProcessofCommunicationinanorganization"	83%
	CO2 To demonstratecompetenceinthefundamentalsofbusiness writing & willenablethestudentstoaugmenttheirreportwritingskills	84%
	CO3 ItwillhelpthemtoidentifytheBarriersofCommunication and measures to overcome.	83%
	CO4 Itwillenable themtoapply the expertise to frame professional cover letter and professional resume.	82%
MB 104	CO1: Student will develop an understanding of different conditions & warranties, the passing of ownership rights by applying the knowledge of the Sale of goods Act and different types of negotiable instruments in different socio environmental situations.	80%
	CO2: Analysis of companies formation, memorandum, articles, and prospectus will be done to the students for their proper understanding of the Companies Act. Consumer protection act is analyzed to them for	81%

	them to remember and if required to apply in real-life scenarios.Illustration of inflation and its impact on business, unfair trade practice for better understanding of the business	
MB 105	CO1 Students will be able to contemplate the ethical standards to be maintained in professional set ups.	85%
	CO2 Students will be able to analyze Indian values related to business enterprises and merge them with relevant global concepts.	84%
	CO3 Students will be able to work comfortably in the professional world.	86%
	CO4 Students will be able to emerge as successful Managers/ leaders and lead a bright life.	84%
MB 106	CO1 Understanding the concept of business or industry related operational problems and then applying the knowledge Operations Research to solve it.	
	CO2 Understanding the concept of Probability and Statistics to analyze the problems of Business processes.	65%

Subject Code & Subject Name	**COs**	**Attainment**
MB 301 : ENTREPRENEURSHIP & PROJECT MANAGEMENT	CO1: Understand the concept of management, Organization, planning, Staffing and learn the Project evaluation, termination, and controlling process	82%
	CO2: To evaluate the role of entrepreneurs in economic development, and barriers, Identification of business opportunities, and feasibility studies.	98%
MB 302 Corporate	CO1To understand and apply the methods of environmental scanning, strategic planning techniques & formulation strategies	81%

Strategy	for holistic strategic management in organization.	
	CO2 To analyze and evaluate the strategic actions, strategic implementation and evaluation strategies.	83%
HRM 301 TEAM DYNAMICS AT WORK	CO1: be able to understand the meaning of group dynamics and evaluate the concepts and theories behind the group formations including the Schachter Study and its implications.	93%
	CO2: The student will be able to evaluate effective team building strategies and apply knowledge in solving contemporary issues related with teams in modern organisations	93%
HRM 304 Organizational Design	CO1: To apply organization theory for better understanding of organizational structure and design	83%
	CO2: To analyze different organizational models for reshaping organizations.	82%
MM 302: Digital & Social Media Marketing	CO1: To explain the understanding of digital & social media marketing plan that will address common marketing challenges	81%
	CO2: Applying concepts, approaches & the practical aspects of various digital & social media marketing tools like SEO, Paid Search, Social, Mobile, Email & Display media & marketing analytics	81%
	CO3: Analyze key performance indicators tied to any digital & social Media program & Develop return on investment model for any digital & social marketing program	78%
	CO4: Apply creative ideas or evolve with existing ideas for development of effective digital & social marketing communication	82%
MM 303 :Integrated Marketing Communication	CO1: To explain the understanding of essential concepts & techniques for the development & designing of an effective IMC program	82%
	CO2: Applying concepts, approaches & the practical aspects of various communication tools	82%
	CO3: Analyze effectiveness of different IMC tools for business firms	77%
	CO4: Apply creative ideas for development of effective marketing communication	82%
FM 302 Project	CO1: To define the Project life cycle, the role of stakeholders and pr	77%

Appraisal and Finance	management processes and to explain the concepts of pr specifications, financial projections, scope and team in Pr management.	
	CO2: To describe and evaluate the risks involved in projects and associated costs as demonstrate the control and closure process relat project management.	75%
FM 304 Corporate Finance	CO1:To define and discuss the concepts & theories related to financial management.	77%
	CO2:To describe and apply the various theories, tools and techniques of Corporate Finance to resolve real life financial problems	75%

Subject Code & Subject Name	COs	Attainment
MB 201 Indian Economy and Policy	CO1: To Explain and design the concepts of circular flow, theo income determination, inflation, unemployment, LPG model, as w banking, trade policy and monetary reforms.	85%
	CO2: To Develop ideas of the Indian Economy and grasp the import of planning undertaken by the government of India.	83%
MB 202 Financial Reporting, Statement and Analysis	CO1: To explain the understanding of the concepts and apply the practical life like basic financial accounting concept, preparing boo accounts, introduction of Accounting Standard, preparation of fina statements and its analysis.	71%
	CO2: To Summarize the financial transactions in terms of Fina Statements and interpret Financial Statements by using diff financial tools and techniques.	74%
MB 203: Marketing Management	CO1: To identify & analyze the scope & significance of marketing in Domain Industry	80%
	CO2: To Analyze & examine marketing concepts & phenomenon to current business events in the industry	79%
	CO3: Map the various marketing environment variables & demonstrate them for designing marketing strategies for business firms	80%
	CO4: Demonstrate market analysis skill for developing innovative marketing strategies for firms	79%

MB 204 : OPERATIONS MANAGEMENT	CO1: To understand the suitable control technique in stores, Inventory, and vendor management is adopted for the production is identified.	80%
	CO2: To analyze the scheduling techniques applied in the operations were learned by the students	75%
MB 205 MANAGEMENT INFORMATION SYSTEM	CO1: To identify the technologies and methods used for effective decision-making in an organization	92%
	CO2: Make students understand the concepts and terminologies used in Database Management, Systems, SQL, Concurrency Management, and the extended part of data storage technology,Data Warehousing.	96%
MB 206 : HUMAN RESOURCE MANAGEMENT	CO1: The student will be able to understand and apply the various concepts behind Human Resource Management and development including planning, Performance Appraisal Systems and strategic HR management.	95%
	CO2: The student will be able to understand and apply the theories and strategic concepts behind compensation Management, Industrial Relations and discipline including workers participation in management.	85%

4th Semester

Subject Code & Subject Name	COs	Attainment
HR 401 MANPOWER PLANNING, RECRUITMENT& SELECTION	CO1: Student will be able to understand and analyze the various manpower planning mechanisms in an organization including forecasting techniques, management information systems and human resources audits.	93%
	CO2: Student will be able to apply and exercise various HRM implementation strategies including recruitment and solve case studies pertaining to real life organisational issues and situations.	93%
HR402Employee Relations &Labour Laws	CO1:To understand EPM,WPM ,concept of collective bargaining,trade unionism in India	84%
	CO2:To apply the various labour legislations in real life industrial scenario	79%
HR 404Performance Management System	CO1: To identify and apply performance planning ,monitoring, appraisal techniques & strategies for better performance management.	83%
	CO2: To understand balance scorecard, competency mapping for application in reward management, employee engagement and	82%

	potential appraisal	
HR 406 INTERNATIONAL HRM	CO1: Student will be able to understand International human resources management and development including the recruitment processes of such candidates.	93%
	CO2: The student will be able to remember and apply legislative measures meant for industrial relations, CSR and employee representation in the international sector and create compensation plans commensurate with the same.	93%
MM 401	CO1:Analysis consumer behaviour and its Impact on marketing strategies. Illustration of consumer decision process.Studednts will be understanding demographic and psychographic characteristics and market segmentation.Analysis of the relation between consumer perception with marketing stimuli.Students will learn to apply the knowledge of consumer motivation for marketing strategy and its relation with corporate social responsibility.	82%
	CO2: Students will develop the understanding of characteristics and functions of attitude, cross-cultural understanding of consumer behaviour and data analysis for consumer feedback researches.Students will comprehend and write effective technical reports. They will be able to analyse case studies,explain relevant materials,communicate effectively, identify the appropriate key words,use grammatically correct English for documentation.	85%
MM 403: Sales & Distribution Management	CO1: To explain the understanding of sales & distribution processes in Organization	77%
	To get familiarized with concepts, approaches & the practical aspects of the key decision-making variables in sales management & distribution channel management	75%
	CO3: To explain market analysis methods & selling concepts	78%
	CO4: To develop Performance evaluation methods, ethics, trends in sales & distribution management	76%
MM 404: Service Marketing	CO1: To explain the understanding of types, nature, classification & marketing mix of service marketing	77%
	CO2: Analyze service product concept, branding & service positioning that transforming service marketing to a great extent	75%
	CO3: To explain market analysis methods of service marketing	78%
	CO4: Demonstrate the role of identifying the people in service & the role of customer in service delivery	76%
MM 406:	CO1: To explain the understanding of global business	77%

International Marketing	activities, marketing processes in international business	
	To get familiarized with concepts, approaches & the practical aspects of the key decision-making variables & global forces that transforming international marketing	75%
	CO3: To develop general perspective about managing international marketing	76%
	CO4: To develop evaluation methods for International Marketing both in operational as well as strategic context	78%
OM 402 Behavioral Operations Management	CO1: To apply experimental learning theories & organizational behavior to ensure performance in work design	83%
	CO2: To understand emotional intelligence in operations management & supply chain management	82%
FM 401 Investment Analysis & Portfolio Management	CO1To explain the understanding of the concepts and apply them like portfolio diversification, Construction, portfolio management, portfolio revision, portfolio evaluation, portfolio protection, and portfolio performance measures.	77%
	CO2To implement strategies to make an impact on the students in taking investment decisions, and properly manage the portfolio.	75%
FM402 Managing Banks & Financial Institutions	CO1To explain the understanding of the concepts and apply them like banking industry models, bank support mechanism, Basel committee I & II, interest rate, risk management, liquidity management and credit risk management.	80%
	CO2 Evaluate and analyse the fundamentals & technical aspects of managing banks and financial institutions.	79%
FM405International Finance	CO1To explain the understanding of the concepts and apply them like international financial management, international monetary System, balance of payments, exchange rate determination and foreign exchange market.	75%
	CO2Evaluate and analyse the fundamentals & technical aspects of International financial market.	72%
FM406 Financial Markets and Services	CO1To Discuss the Indian Financial System and multiplicity of Financial Instruments and understand the Indian financial system, money market, secondary market, SEBI, mutual Funds and credit rating agencies.	76%
	CO2 Examine Mutual Funds and Merchant Banking under the nodal agency SEBI.	80%

Civil Engineering Department
CO ATTAINMENT
2021-2022

Paper Code (Name)	CO	COURSE OUTCOMES(COs)	ATTAINED (%)
1ST SEMESTER			
BS-PH101 Chemistry-I	**CO1**	Analyse microscopic chemistry in terms of atomic and molecular orbitals and intermolecular forces to solve different engineering problems.	72
	CO2	Rationalise bulk properties and processes using thermodynamic consideration for various engineering applications.	61
	CO3	Distinguish the ranges of the electromagnetic spectrum used for exciting different molecular energy levels in various spectroscopic techniques.	82
	CO4	Rationalise periodic properties (ionization potential, electro negativity, oxidation states) for various engineering applications.	87
	CO5	Apply the knowledge of structure, stability and reactivity of organic molecular species in order to gain a clear insight into the mechanism of chemical and biochemical reacting systems used in various engineering problems.	75
BS PH-101 (Physics-I)	**CO1**	Apply the knowledge of simple harmonic motion (ideal and real cases) and basic concepts of Mechanics for the solution of complex problems.	81
	CO2	Utilize the knowledge of vector calculus and different coordinate system for the solution of complex problems.	72%
	CO3	Apply the knowledge of physical optics (interference, diffraction, polarization) and LASER to solve different complex problems	75%
	CO4	Apply the knowledge of dielectric and magnetic properties of materials to interpret different complex systems.	83%
	CO5	Utilize the knowledge of Quantum Physics to analyze a complex engineering problem.	69%
	CO6	Apply the knowledge statistical mechanics to solve complex problems.	79%
BS-M101/ BS-M102 Mathematics –IA*/ Mathematics –IB *	**CO1**	Understand the properties of complex functions and their behavior. Know the techniques for evaluating complex integrals and series. Learn the theory of analytic functions, conformal mapping, the Cauchy-Riemann equations, concept of Taylor and Laurent series, complex integration, Liouville's theorem, residues and the Residue Theorem	75%
	CO2	Understand the concept of a differential equation and its solution. Know the techniques for solving first-order and second-order differential equations,	78%

		Cauchy-Euler differential equation, Bessel's equation, indicial equations, power-series solution.	
	CO3	Understand the concept of integration over two or three-dimensional regions/volumes. Know the techniques for evaluating double and triple integrals, including change of variables and polar, cylindrical, and spherical coordinates	78%
	CO4	Understand the statement of Stokes' theorem, Green's theorem and how to apply it to compute line integrals. Understand the concept of a curve and its parameterization. Know the techniques for evaluating line integrals, including parametric and vector forms. Understand the concept of a surface and its parameterization. Know the techniques for evaluating surface integrals, including parametric and vector forms. Understand volume integrals and Gauss divergence theorem.	74%
BS-PH191/ BS-CH191 Physics-I Laboratory (Gr-A)/ Chemistry-I Laboratory (Gr-B)	**CO1**	Organize/Design the experiment related to Chemical Science as applicable in various Engineering problems.	71%
	CO2	Generate experimental Data related to Chemical Science as applicable in complex problems.	68%
	CO3	Conduct actual experiment related to Chemical Science as applicable in different engineering application.	78%
	CO4	Analyze data and draw conclusion related to Chemical Science as applicable in various engineering problems.	83%
	CO5	Analyze with proper experimental data and graphs and communicate effectively related to Chemical Science as applicable in different engineering fields.	85%
BS PH-191 (Physics-Lab 1)	**CO1**	Organize/design the experiment related to various systems and interpret the physical properties of material.	72%
	CO2	Generate experimental Data related to electrical and magnetic properties.	80%
	CO3	Conduct actual experiment related to optical phenomena.	78%
	CO4	Analyze data and draw conclusion related to quantum physics.	85%
	CO5	Analyze with proper experimental data and graphs and communicate effectively.	75%
ES-ME191/ ES-ME192 Engineering Graphics & Design (Gr-B)/ Workshop /Manufacturing Practices(Gr-A)	**CO1**	Introduction to engineering design and its place in society	87%
	CO2	Exposure to the visual aspects of engineering design	85%
	CO3	Exposure to engineering graphics standards	89%
	CO4	Exposure to solid modelling	84%
2ND SEMESTER			
BS-CH201	**CO1**	Analyse microscopic chemistry in terms of atomic and molecular orbitals	69%

Chemistry-I		and intermolecular forces to solve different engineering problems.	
	CO2	Rationalise bulk properties and processes using thermodynamic consideration for various engineering applications.	72%
	CO3	Distinguish the ranges of the electromagnetic spectrum used for exciting different molecular energy levels in various spectroscopic techniques.	78%
	CO4	Rationalise periodic properties (ionization potential, electro negativity, oxidation states) for various engineering applications.	81%
	CO5	Apply the knowledge of structure, stability and reactivity of organic molecular species in order to gain a clear insight into the mechanism of chemical and biochemical reacting systems used in various engineering problems.	82%
BS PH-201 **(Physics-I)**	**CO1**	Apply the knowledge of simple harmonic motion (ideal and real cases) and basic concepts of Mechanics for the solution of complex problems.	82%
	CO2	Utilize the knowledge of vector calculus and different coordinate system for the solution of complex problems.	79%
	CO3	Apply the knowledge of physical optics (interference, diffraction, polarization) and LASER to solve different complex problems	74%
	CO4	Apply the knowledge of dielectric and magnetic properties of materials to interpret different complex systems.	86%
	CO5	Utilize the knowledge of Quantum Physics to analyze a complex engineering problem.	76%
	CO6	Apply the knowledge statistical mechanics to solve complex problems.	69%
BS-M201/ BS-M202 Mathematics –IIA# / Mathematics –IIB #	**CO1**	Understand the properties of complex functions and their behavior. Know the techniques for evaluating complex integrals and series. Learn the theory of analytic functions, conformal mapping, the Cauchy-Riemann equations, concept of Taylor and Laurent series, complex integration, Liouville's theorem, residues and the Residue Theorem.	85%
	CO2	Understand the concept of a differential equation and its solution. Know the techniques for solving first-order and second-order differential equations, Cauchy-Euler differential equation, Bessel's equation, indicial equations, power-series solution.	88%
	CO3	Understand the concept of integration over two or three-dimensional regions/volumes. Know the techniques for evaluating double and triple integrals, including change of variables and polar, cylindrical, and spherical coordinates	85%
	CO4	Understand the statement of Stokes' theorem, Green's theorem and how to apply it to compute line integrals. Understand the concept of a curve and its parameterization. Know the techniques for evaluating line integrals, including parametric and vector forms. Understand the concept of a surface and its parameterization. Know the techniques for evaluating surface	80%

		integrals, including parametric and vector forms. Understand volume integrals and Gauss divergence theorem.	
HM-HU201 English	**CO1**	to be able to **use** the correct vocabulary in order to express oneself in English properly	62%
	CO2	to be able to **identify** common errors in terms of grammar and choice of words in English	58%
	CO3	to be able to **describe**, **discuss**, and **interpret** reading input in English	75%
	CO4	to be able to **demonstrate** that one can express oneself in English through writing	64%
BS-PH291/ BS-CH291 Physics-I Laboratory(Gr B)/ Chemistry-I Lab(GrA)	**CO1**	Organize/Design the experiment related to Chemical Science as applicable in various Engineering problems.	72%
	CO2	Generate experimental Data related to Chemical Science as applicable in complex problems.	78%
	CO3	Conduct actual experiment related to Chemical Science as applicable in different engineering application.	83%
	CO4	Analyze data and draw conclusion related to Chemical Science as applicable in various engineering problems.	76%
	CO5	Analyze with proper experimental data and graphs and communicate effectively related to Chemical Science as applicable in different engineering fields.	84%
BS PH-291 (Physics-Lab 1)	**CO1**	Organize/design the experiment related to various systems and interpret the physical properties of material.	80%
	CO2	Generate experimental Data related to electrical and magnetic properties.	78%
	CO3	Conduct actual experiment related to optical phenomena.	85%
	CO4	Analyze data and draw conclusion related to quantum physics.	68%
	CO5	Analyze with proper experimental data and graphs and communicate effectively.	79%
ES-ME291/ ES-ME292 Engineering Graphics & Design(Gr-A)/ Workshop/Manufacturing Practices(GrB)	**CO1**	Introduction to engineering design and its place in society•	95%
	CO2	Exposure to the visual aspects of engineering design	95%
	CO3	Exposure to engineering graphics standards	95%
	CO4	Exposure to solid modelling	95%
HU291 Language Laboratory	**CO1**	to be able to **describe, discuss**, and **interpret** the listening input in English	55%
	CO2	to be able to **demonstrate** that one can express oneself in English through speaking	54%
	CO3	to be able to **describe, discuss,** and **interpret** reading input in English	77%
	CO4	to be able to **demonstrate** that one can express oneself in English through writing	67%

3RD SEMESTER			
CE(ES)302 **Energy Science**	**CO1**	Understanding the various sources of energy and its interaction with the environment	67%
	CO2	Designing energy efficient structures	67%
CE(HS)302 – INTRODUCTION TO CIVIL ENGINEERING	**CO1**	= To acquire knowledge about basic civil engineering techniques and apply the acquired knowledge in basic civil engineering problems..	77%
CE(ES)392 **Computer aided Civil Engineering Drawing**	**CO1**	To understand the concept of engineering drawings and apply the same using computer aided design technology	79%
4TH SEMESTER			
CE(ES)401 Introduction to Fluid Mechanics	**CO1**	To understand about the properties and characteristics of fluid	90.8%
	CO2	To understand, analyze and evaluate the different characteristics, pattern and types of fluid flow and hydraulic machines.	90.2%
CE(ES)40 Introduction to Solid Mechanics	**CO1**	Deterministic approaches for understanding interaction between material characteristic with load and time	89.9%
	CO2	Knowledge about materials and structures and understand their deformation under load and Mathematical representation of the structure property	89.6%
CE(PC)401- **Soil Mechanics** – I	**CO1**	To understand, evaluate and gather knowledge about physical properties of soil and analyze the soil-water interaction system.	93.3%

	CO2	To understand and analyze the stress distribution and shear strength characteristics of soils.	92.8%
CE(PC)402- Environmental engineering -I	**CO1**	Analyzing the sources, requirements, quality and treatment of water and design of the patterns of conveyance and distribution	92.2%
	CO2	Analyzing the characteristics of municipal solid waste and it's handling by engineering systems.	92.4%
CE(PC)403- Surveying and Geomatics	**CO1**	To understand the basic principles of surveying and geomatics	92.4%
	CO2	To evaluate the different techniques of surveying and geomatics in solving basic problems and also analyze different and advanced technique of surveying	92.2%
CE(PC)404- CONCRETE TECHNOLOGY	**CO1**	Understanding the properties , raw materials required for designing fresh and hardened concrete	92%
	CO2	Analysing the mix design of concrete	91%
CE(HS)401- CE-SOCIETAL and global impact	**CO1**	Understanding the historical perspectives in the overall development of civil engineering	92.5%
	CO2	Understanding the challenges of future civil engineering projects	92.8%
CE(ES)491- FLUID LABORATORY	**CO1**	Apply the knowledge of fluid characteristics for determination of various parameters related to fluid flow through experimentation.	94.4%
CE(ES)492- SOLID MECHANICS LABORATORY	**CO1**	Apply the knowledge of material characteristics to determine various strength parameters through experimentation.	94%
CE(ES)493- ENGGINEERING GEOLOGY LABORATORY	**CO1**	Apply the knowledge of Engineering Geology in determining the physical properties of rocks and minerals and to understand and delineate different geological structures by the interpretation of geological maps	94.4%

CE(PC)493-SURVEYING AND GEOMATICS LABORATORY	**CO1**	Application of the knowledge of surveying and geomatics for determination of different methods of surveying for measurement	94.3%
CE(PC)494-CONC LAB	**CO1**	Applying the knowledge of Concrete technology in determining the various parameters of Concrete and its design.	94.5%
5TH SEMESTER			
CE(PC)501-DESIGN OF RC STRUCTURES	**CO1**	To understand about the concept of limit state and working stress method of design.	70.4%
	CO2	To understand, analyze and evaluate about the design of different types of RC structures by Limit State Method and Working Stress Method.	70.2%
CE(PC)502 ENGINEERING HYDROLOGY	**CO1**	Understanding the basic concepts of Hydrology.	86.1%
	CO2	Analysis of different hydrological parameters and mitigation methods of floods and flood management.	85.8%
CE(PC)503-structURAL ANALYSIS -I	**CO1**	Knowledge of static , determinate and indeterminate structures	83.1%
	CO2	Analysis of all type of structure of its stability and instability	82.8%
CE(PC)504-SOIL MECHANICS - 2	**CO1**	To understand, evaluate and analyze about consolidation, compaction and earth pressures of soil.	85.1%
	CO2	To understand, analyze, evaluate the bearing capacity and settlement analysis of shallow foundation and slope stability analysis of any manmade or natural slope.	84.7%
	CO1	**Define the basic concepts and terminologies of waste water engineering, hazardous waste management, Plumbing systems for water supply**	90.3%

CE(PC)505-ENVIRONMENTAL ENGINEERING 2		**and waste water disposal**	
	CO2	Apply the methods of quantifying sanitary sewage and storm sewage, solve mathematical problems and design different processes operations involved in waste water treatment.	90%
CE(PC)506-TRANSPORTATION ENGINEERING	**CO1**	TO UNDERSTAND THE KNOWLEDGE OF PLANNING,DESIGN AND THE FUNDAMENTAL PROPERTIES OF HIGHWAY MATERIALS IN HIGHWAY ENGINEERING	94.2%
	CO2	APPLY AND INTERPRET THE KNOWLEDGE OF GEOMETRIC DESIGN AND TRAFFIC STUDIES	93.4%
CE(PC)591-RC DESIGN SESSIONAL	**CO1**	Apply the knowledge of RCC structure.	69.7%
CE(PC)594-SOIL MECHANICS LABORATORY	**CO1**	Understand every aspect of soil investigation and prepare a lab report	94.8%
CE(PC)595-ENVIRONMENTAL ENGINEERING LABORATORY	**CO1**	Organize/Design the experiment related to Digital Signal Processing Lab**.**	85.1%
CE(PC)596-TRANSPORTATION LABORATORY	**CO1**	TO understand the application of different laboratory tests.	86.4%
CE(PC)597-COMPUTER APPLICATION IN CIVIL ENGINEERING	**CO1**	Understanding Computer applications to apply in civil engineering field	94.06%

6TH SEMESTER

CE(PC)601-CONSTRUCTION ENGINEERING AND MANAGEMENT	**CO1**	To Understand how structures are built.	96%
	CO2	To evaluate the necessary steps for the completion of a project from the beginning to the end.	95%
CE(PC)602-ENGINEERING ECONOMICS,ESTIMATION AND COSTING	**CO1**	To understand the principles of economics and it's application on value analysis of civil engineering projects	78.7
	CO2	To understand the technical specifications of rate analysis, Tender and valuation performed for a project and analyse the cost of a structure through these parameters.	78.4
CE(PC)603-WATER RESOURCE ENGINEERING	**CO1**	To apply the fundamentals of flow in open channel to design them accordingly	90.17
	CO2	To understand the different concepts of Irrigation in connection with the water requirement for different crops and obtain knowledge about various ground water resources	89.37
CE(PC)604- DESIGN OF STEEL STRUCTURES	**CO1**	Understanding the properties and its utility in civil engineering design	83%
	CO2	Analysis of the use of steel in designing various structures	83%
CE(PE)601B-FOUNDATION ENGINEERING	**CO1**	Gain basic knowledge about the bearing capacity of shallow and deep foundation at site and gain some knowledge about soil investigation and exploration	84.2
	CO2	Analyse the design of sheet pile structure on the basis of earth pressure theories and understand and apply various types of ground improvement methods for solving complex geotechnical problems	84%
CE(PE)602A-BUILDING,CONSTRUCTION AND PRACTICE	**CO1**	Understand the knowledge of various structures that used in civil engineering construction	87.8

CE(PC)693-Water Resource Laboratory	**CO1**	To apply different techniques for proper use of water as an useful resource.	87%
CE(PC)694-STEEL STRUCTURE DESIGN SESSIONAL	**CO1**	Apply the knowledge of steel structure in design	74.7
CE(PC)695-QUANTITY SURVEYESTIMATION AND VALUATION SESSIONAL	**CO1**	To evaluate about the specification and valuation of works and materials used in any civil engineering construction project	79.3

7TH SEMESTER

CE(OE)701A-METRO SYSTEM AND ENGINEERING	**CO1**	understand the overview of how the metro system works	84.9%
	CO2	to apply the knowledge of different metro sysytem engineeirng works	84.5%
CE(PE)701C-HYDRAULIC STRUCTURES	**CO1**	To understand and evaluate about the characteristics of various types and components of dams and their selection procedure.	82.8%
	CO2	To analyze about the stability analysis of different hydraulic structures (dam) and estimate about different types of forces, seepage loss and discharge calculation acting on dams and their remedial measures .	82.1%
CE(PE)702A-PRESTRESS CONCRETE	**CO1**	Understanding the purpose, parameters and application of Prestressed Concrete structure	96.3
	CO2	Design of Prestressed Concrete Structures	96.4
CE(PE)703A-	**CO1**	Understanding the concepts of air and noise pollution, methods of their	91%

AIR AND NOISE POLLUTION		measurement.	
	CO2	Analyze the concepts of air and noise pollution solving mathematical problems and design techniques for air and noise pollution control	90.6%
CE(PE)704C-COASTAL HYDRAULICS AND SEDIMENT TRANSPORT	**CO1**	Understanding the various mechanisms involved in generation of tides, currents and waves and its implications on sediment transport.	80.6%
	CO2	Applying the knowledge of wave current mechanics and sediment transport in analyzing different shore line and coastal structures	80.26%
CE(PE)705A-RAILWAY AND AIRPORT ENGINEERING	**CO1**	to acquire the knowledge of basic railway engineering	72.2%
	CO2	to acquire the knowledge of basic airport engineering.	71.13%

8TH SEMESTER

CE(PE)801D PAVEMENT MATERIALS	**CO1**	To understand about the different materials for suitability of road and their availability characteristics.	77.6
	CO2	**To understand and evaluate the properties of soil and physical modification of pavement works**	77.3
CE(0E)801C DEEP FOUNDATION	**CO1**	To understand, evaluate and analyze about the selection of suitable type of deep foundation for various site conditions.	77.56
	CO2	To understand, analyze and evaluate the concept about bearing capacity of different types of deep foundations.	77

Course Details:

Course Name:	**Data Structure & Algorithm**
Course Code:	**PCC-CS301**
Name of the Program:	**B.Tech**
Department	**Computer Science Engineering**
Semester	**3rd Semester**

COURSE OUTCOME:

On successful completion of this course, students should be able to:

CO1	To learn and apply the basics of abstract data types.
CO2	To learn and apply the principles of linear and nonlinear data structures.
CO3	To build an application using sorting and searching.
CO4	Design applications with the knowledge of computation and principles of data structures.

Data Structure & Algorithm		CO	Attainment
	CO1	To learn and apply the basics of abstract data types.	10%
	CO2	To learn and apply the principles of linear and nonlinear data structures.	15%
	CO3	To build an application using sorting and searching.	15%
	CO4	Design applications with the knowledge of computation and principles of data structures.	25%

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		√	√									
CO2		√	√									
CO3			√		√							
CO4			√		√							

Course Details:

Course Name:	Data Structure & Algorithm Lab
Course Code:	PCC-CS391
Name of the Program:	B.Tech
Department	Computer Science Engineering
Semester	3rd Semester

COURSE OUTCOME:

On successful completion of this course, students should be able to:

CO1	Design and develop programs using data structure & algorithm concepts.
CO2	Develop simple applications using linear and non-linear data structures & algorithms concepts and understand the access mechanisms and other use and functionalities.
CO3	Implement searching and sorting concepts
CO4	Implement the concepts of graph and hashing

Data Structure & Algorithm Lab		CO	Attainment
	CO1	Design and develop programs using data structure & algorithm concepts.	15%
	CO2	Develop simple applications using linear and non-linear data structures & algorithms concepts and understand the access mechanisms and other use and functionalities.	10%
	CO3	Implement searching and sorting concepts.	10%
	CO4	Implement the concepts of graph and hashing	25%

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√	√									
CO2	√	√										
CO3		√			√							
CO4		√			√							

Course Details:

Course Name:	**Computer Organization**
Course Code:	**PCC-CS302**
Name of the Program:	**B.Tech**
Department	**Computer Science Engineering**
Semester	**3rd Semester**

COURSE OUTCOME:

On successful completion of this course, students should be able to:

CO1	Understand basic structure of digital computer, stored program concept and different arithmetic and control unit operations.
CO2	Understand basic structure of different combinational circuits- multiplexer, decoder, encoder etc.
CO3	Perform different operations with sequential circuits.
CO4	Understand memory and I/O operations.

Computer Organization		CO	Attainment
	CO1	Understand basic structure of digital computer, stored program concept and different arithmetic and control unit operations.	15%
	CO2	Understand basic structure of different combinational circuits- multiplexer, decoder, encoder etc.	15%
	CO3	Perform different operations with sequential circuits.	25%
	CO4	Understand memory and I/O operations.	10%

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1					√		√					
CO2					√		√					
CO3									√			
CO4					√		√					

Course Details:

Course Name:	**Computer Organization Lab**
Course Code:	**PCC-CS392**
Name of the Program:	**B.Tech**
Department	**Computer Science Engineering**
Semester	**3rd Semester**

COURSE OUTCOME:

On successful completion of this course, students should be able to:

CO1	Understand basic structure of digital computer, stored program concept and different arithmetic and control unit operations.
CO2	Understand basic structure of different combinational circuits- multiplexer, decoder, encoder etc.
CO3	Perform different operations with sequential circuits.
CO4	Understand memory and I/O operations.

Computer Organization Lab		CO	Attainment
	CO1	Understand basic structure of digital computer, stored program concept and different arithmetic and control unit operations.	10%
	CO2	Understand basic structure of different combinational circuits- multiplexer, decoder, encoder etc.	15%
	CO3	Perform different operations with sequential circuits.	15%
	CO4	Understand memory and I/O operations.	10%

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1					√		√					
CO2					√		√					
CO3									√			
CO4					√		√					

Course Details:

Course Name:	**Compiler Design**

Course Code:	**PCC-CS501**
Name of the Program:	**B.Tech**
Department	**Computer Science Engineering**
Semester	**5th Semester**

COURSE OUTCOME:

On successful completion of this course, students should be able to:

CO1	To apply the basic concept of compilers and discuss on the components as well as the strengths and weaknesses of various phases of designing a compiler.
CO2	To understand the role of finite automata in compiler design.
CO3	To design and analyze algorithms for syntactic or parsing techniques and semantic analysis of the process of designing compilers.
CO4	Apply the knowledge of Type Checking andRun-Time Environments in designing a compiler.
CO5	Apply the knowledge of Intermediate Code Generation, Code Optimization and Code Generations in designing a compiler.

COAttainmentofSubjects

		CO	Attainment
Compiler Design PCC-CS501	CO1	To apply the basic concept of compilers and discuss on the components as well as the strengths and weaknesses of various phases of designing a compiler.	5%
	CO2	To understand the role of finite automata in compiler design.	10%
	CO3	To design and analyze algorithms for syntactic or parsing techniques and semantic analysis of the process of designing compilers.	10%
	CO4	Apply the knowledge of Type Checking and Run-Time Environments in designing a compiler.	15%
	CO5	Apply the knowledge of Intermediate Code Generation, Code Optimization and Code Generations in designing a compiler.	15%

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√				√	√					√	
CO2					√		√					
CO3		√	√	√						√		
CO4	√	√			√	√	√				√	
CO5	√	√			√	√	√				√	

Course Details:

Course Name:	**Operating Systems**
Course Code:	**PCC-CS502**
Name of the Program:	**B.Tech**
Department	**Computer Science Engineering**
Semester	**5th Semester**

COURSE OUTCOME:

On successful completion of this course, students should be able to:

CO1	Understand processes and threads.
CO2	Design algorithms for process scheduling for a given specification of CPU utilization, Throughput, Turnaround Time, Waiting Time and Response Time.
CO3	For a given specification of memory organization develop the techniques for optimally allocating memory to processes by increasing memory utilization and for improving the access time. Design and implement file management system.

		CO	Attainment
Operating Systems	CO1	Understand processes and threads.	20%
	CO2	Design algorithms for process scheduling for a given specification of CPU utilization, Throughput, Turnaround Time, Waiting Time and Response Time.	15%
	CO3	For a given specification of memory organization develop the techniques for optimally allocating memory to processes by increasing memory utilization and for improving the access time. Design and implement file management system.	15%

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1					√		√					
CO2			√	√						√		
CO3			√	√			√			√		

Course Details:

Course Name:	**Operating System Lab**
Course Code:	**PCC-CS592**
Name of the Program:	**B.Tech**
Department	**Computer Science Engineering**
Semester	**5th Semester**

COURSE OUTCOME:

On successful completion of this course, students should be able to:

CO1	To Analyze different aspects of Linux.
CO2	To Create or design different scripts using shell programming.
CO3	To Create or design different scripts using shell programming.
CO4	Create shared memory with the implementation of reading from, write into shared memory.

CO Attainment of Subjects

		CO	Attainment
Operating System Lab PCC-CS592	CO1	To Analyze different aspects of Linux.	10%
	CO2	To Create or design different scripts using shell programming.	15%
	CO3	To Create or design different scripts using shell programming.	15%
	CO4	Create shared memory with the implementation of reading from, write into shared memory.	15%

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		√										
CO2			√	√						√		
CO3			√	√						√		
CO4				√								

Course Details:

Course Name:	**Object Oriented Programming**
Course Code:	**PCC-CS503**
Name of the Program:	**B.Tech**
Department	**Computer Science Engineering**
Semester	**5th Semester**

COURSE OUTCOME:

On successful completion of this course, students should be able to:

CO1	Specify simple abstract data types and design implementations, using abstraction functions to document them.
CO2	Recognize features of object-oriented design such as encapsulation, polymorphism, inheritance, and composition of systems based on object identity
CO3	Name and apply some common object-oriented design patterns and give examples of their use
CO4	Design applications with an event-driven graphical user interface.

COAttainmentofSubjects

		CO	Attainment
Object Oriented Programming	CO1	Specify simple abstract data types and design implementations, using abstraction functions to document them.	10%
	CO2	Recognize features of object-oriented design such as encapsulation, polymorphism, inheritance, and composition of systems based on object identity	15%
	CO3	Name and apply some common object-oriented design patterns and give examples of their use	15%
	CO4	Design applications with an event-driven graphical user interface.	5%

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		√	√									
CO2		√	√									
CO3			√		√							
CO4			√		√							

Course Details:

Course Name:	**Object Oriented Programming Lab**
Course Code:	**PCC-CS593**
Name of the Program:	**B.Tech**
Department	**Computer Science Engineering**
Semester	**5th Semester**

COURSE OUTCOME:

On successful completion of this course, students should be able to:

CO1	Design and develop java programs using object oriented programming concepts
CO2	Develop simple applications using object oriented concepts such as package, exceptions
CO3	Implement multi-threading, and generics concepts
CO4	Create GUIs and event driven programming applications for real world problems

CO Attainment of Subjects

Object Oriented Programming Lab		CO	Attainment
	CO1	Design and develop java programs using object oriented programming concepts	15%
	CO2	Develop simple applications using object oriented concepts such as package, exceptions	15%
	CO3	Implement multi-threading, and generics concepts	15%
	CO4	Create GUIs and event driven programming applications for real world problems	15%

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√	√									
CO2	√	√										
CO3		√			√							
CO4		√			√							

Course Details:

Course Name:	**Software Engineering**
Course Code:	**ESC 501**
Name of the Program:	**B.Tech**
Department	**Computer Science Engineering**
Semester	**5th Semester**

COURSE OUTCOME:

On successful completion of this course, students should be able to:

CO1	Apply basic SW engineering methods and practices different models, and their appropriate application, SRS Document.
CO2	Determine the role of project management including planning, scheduling, risk management, etc.
CO3	An understanding of software testing approaches such as unit testing and integration testing.
CO4	An understanding of software evolution and related issues such as version management.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√				√	√					√	
CO2			√	√						√		
CO3					√		√					
CO4					√		√					

CO AttainmentofSubjects

Software Engineering		CO	Attainment
	CO1	Apply basic SW engineering methods and practices different models, and their appropriate application, SRS Document.	15%
	CO2	Design the role of project management including planning, scheduling, risk management, etc.	15%
	CO3	An understanding of software testing approaches such as unit testing and integration testing.	15%
	CO4	An understanding of software evolution and related issues such as version management.	10%
PaperCode (Name)	**CO Number**	**Course Outcomes(CO)**	**ATTAINED**

HSMC301 Economics for Engineers	**CO1**	Analyze the economic decisions making, engineering costs & estimation and classification of costs by applying the knowledge of estimating models. Student will develop an understanding of cash-flow, Rate of return analysis in different socio-environmental situations.	15 %
	CO2	Analyze the inflation and price change would be done to the students for the proper understanding of the price-indexes in economic analysis. Effect of inflation & deflation is analyzed to them to remember and if required to apply in real-life scenarios.	25 %
	CO3	Recognize the types of property, depreciation and expenses and its impact on business,for better understanding of the business environment and apply the knowledge of it.	16 %

Mapping of Course Outcomes and Program Outcomes for the subject Economics for Engineers(HSMC301)

CourseOutcomes	Program Outcomes											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		✓		✓								
CO2		✓		✓								
CO3							✓					✓

PaperCode(Name)	CO Number	Course_Outcoms (CO)	ATTAINED
PEC-IT501B ArtificialInte lligence	CO1	Apply the goodprogramming skillsto formulate thesolutions forcomputationalpr oblems.	25%
	CO2	Design and developsolutions forinformed anduninformed searchproblemsinA I.	20%
	CO3	Understandandenric h knowledge toselect and apply AItools to synthesizeinformati on anddevelopmodelsw ithin constraints ofapplicationarea.	25%

Mapping of CourseOutcomes and ProgramOutcomesfor theArtificialIntelligence

CourseO utcomes	Program Outcome s											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	✓				✓	✓					✓	
CO2			✓	✓						✓		
CO3					✓		✓					

Paper Code(Name)	**CO Number**	**CourseOutcomes(CO)**	**ATTAINED**
HSMC501, Industrial Management	CO1	Analyze the concept of innovation andentrepreneurship,contributionsofentrepreneurstothe society,risk-opportunitiesperspectivebyapplyingtheknowledgeoffactorsaffectingthem.	25%
	CO2	Analyze the project management, issuesandproblemsinprojectmanagement, projectlife cycle-initiation/conceptualization phase, determination ofproject feasibility studies would be donetothestudents fortheirproper understandingofsocialcostbenefitanalysis.	20%
	CO3	Identification and illustration of thecritical path and its significance, types offloatsand slacksanditsimpactonbusiness, for better understanding of therecent trendsand applytheknowledge of it.	15%

MappingofCourseOutcomesandProgramOutcomesforthesubjectIndustrialManagement(HSMC501)

Course Outcomes	Program Outcomes											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		✓		✓								
CO2		✓		✓								
CO3		✓					✓					

PaperCode (Name)	CO Number	Course Outcomes(CO)	ATTAINED
PEC-IT501B Introductionto Philosophicalthoughts	CO1	Identifytheevaluation ofthehistoryof philosophy.	10%
	CO2	Identifyreligious concepts,traditions, andhistoricalpractices overtimeand across cultures.	25%
	CO3	Analyzecourse-related materialtoevaluatethe historicaldevelopment ofcontemporaryissues.	15%

MappingofCourseOutcomesandProgramOutcomesforthesubjectPhilosophicalthoughts(OEC-CS701B/C)

CourseOutcomes	ProgramOutcomes											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		✓										
CO2		✓										
CO3		✓		✓								

PaperCode (Name)	CO Number	Course Outcomes(CO)	ATTAINED

PEC-CS701B CloudComputing	CO1	Understand thefundamentalprincipl esofdistributedcomputi ng.	15%
	CO2	Understand theimportanc eof virtualizationin distributedcomputing andhowthishasenabled thedevelopmentofClou d Computing	20%
	CO3	Identifyanddefine technicalchallengesfor cloudapplicationsand assesstheirimportance.	15%

MappingofCourseOutcomesandProgramOutcomesforthesubjectCloudComputing(PEC-CS701B)

CourseO utcomes	ProgramOutcome s											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1							✓					
CO2							✓					
CO3		✓										

Course Details:

Course Name:	CyberSecurity
Course Code:	PEC-CS 702E
Name of the Program:	**B.Tech**
Department	**Computer Science Engineering**
Semester	**7th Semester**

PaperCode (Name)	CO Number	Course Outcomes(CO)	ATTAINED
PEC-CS702E CyberSecurity	CO1	Recognize andanalyzesoftware vulnerabilitiesandsecu ritysolutions toreduce the risk ofexploitation.	25%
	CO2	Design operational andstrategic cyber securitystrategiesand policies.	25%
	CO3	Implement cyber securitysolutionsanduse ofcybersecurity,inform ationassurance,andcybe r/computer forensicssoftware/tools.	10%

MappingofCourseOutcomesandProgramOutcomesforthesubjectCyberSecurity(PEC-CS702E)

CourseO utcomes	ProgramOutcome s											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		✓		✓								✓
CO2			✓	✓								
CO3				✓								

Paper Code(Name)	CO Number	CourseOutcomes(CO)	ATTAINED
	CO1	Analyzetheconceptofinnovationandent repreneurship,contributionsofentrepre neursto thesociety,risk-opportunities perspective by applyingtheknowledgeoffactorsaffecting them.	10%

HSMC701,Project ManagementandEntrepreneurship	CO2	Analyzetheproject management,issuesandproblems in projectmanagement,projectlife cycle-initiation/conceptualization phase, determinationof project feasibility studies will bedone tothe studentsfortheirproper understandingofsocialcostbenefitanalysis.	15%
	CO3	Identify and recognize the critical pathand its significance, types of floats andslacks and its impact on business, forbetterunderstanding oftherecent trends and applythe knowledgeofit.	25%

MappingofCourseOutcomesandProgramOutcomesforthesubjectProjectManagement and Entrepreneurship(HSMC701)

CourseOutcomes	ProgramOutcomes											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		✓		✓								
CO2		✓		✓								
CO3		✓										✓

Course Name:	**Design and Analysis of Algorithms**
Course Code:	**PCC-CS404**
Name of the Program:	**B.Tech**
Department	**Computer Science Engineering**
Semester	**4th Semester**

COURSE OUTCOME:

On successful completion of this course, students should be able to:

CO1	To analyze and identify the Complexity of a problem and compute the recurrence relation.
CO2	To analyze the several algorithms design techniques on some certain problems using divide & conquer method, dynamic programming approach and backtracking, greedy method.
CO3	To understand lower bound theory, graph traversal algorithm, network flow, disjoint set manipulation different method.
CO4	To design the algorithm of string matching problem, matrix manipulation algorithm.
CO5	To understand amortize analysis, approximation algorithm, notion of NP-completeness.

COAttainmentofSubjects

		CO	Attainment
Design and Analysis of Algorithms (PCC-CS404)	**CO1**	To analyze and identify the Complexity of a problem and compute the recurrence relation.	10%
	CO2	To analyze the several algorithms design techniques on some certain problems using divide & conquer method, dynamic programming approach and backtracking, greedy method.	15%
	CO3	To understand lower bound theory, graph traversal algorithm, network flow, disjoint set manipulation different method.	5%
	CO4	To design the algorithm of string matching problem, matrix manipulation algorithm.	15%
	CO5	To understand amortize analysis, approximation algorithm, notion of NP-completeness.	15%

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		√										
CO2		√	√	√						√		
CO3					√		√					
CO4			√	√						√		√
CO5					√		√					

Course Details

Course Name:	Design and Analysis of Algorithm Lab
Course Code:	**PCC-CS494**
Name of the Program:	**B.Tech**
Department	**Computer Science Engineering**
Semester	**4th Semester**

COURSE OUTCOME:

On successful completion of this course, students should be able to:

CO1	Design algorithm and implement C program using divide and conquer approach in Computer Science and Engineering and related fields.
CO2	Design algorithm and implement C program using dynamic programming in Computer Science and Engineering and related fields.
CO3	Design algorithm and implement C program using branch and bound method in Computer Science and Engineering and related fields.
CO4	Design algorithm and implement C program using backtracking in Computer Science and Engineering and related fields.
CO5	Design algorithm and implement C program using greedy method in Computer Science and Engineering and related fields.
CO6	Design Graph Traversal Algorithm and implement C program in Computer Science and Engineering and related fields.

COAttainment

		CO	Attainment
Design and Analysis of Algorithm Lab (PCC-CS494)	**CO1**	Design algorithm and implement C program using divide and conquer approach in Computer Science and Engineering and related fields.	15%
	CO2	Design algorithm and implement C program using dynamic programming in Computer Science and Engineering and related fields.	5%
	CO3	Design algorithm and implement C program using branch and bound method in Computer Science and Engineering and related fields. App	5%
	CO4	Design algorithm and implement C program using backtracking in Computer Science and Engineering and related fields.	15%
	CO5	Design algorithm and implement C program using greedy method	10%

		in Computer Science and Engineering and related fields.	
	CO6	Design Graph Traversal Algorithm and implement C program in Computer Science and Engineering and related fields.	15%

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			√	√						√		
CO2			√	√						√		
CO3			√	√						√		
CO4			√	√						√		
CO5			√	√						√		

Course Name:	**Computer Architecture**
Course Code:	**PCC-CS402**
Name of the Program:	**B.Tech**
Department	**Computer Science Engineering**
Semester	**4th Semester**

COURSE OUTCOME:

On successful completion of this course, students should be able to:

CO1	Design pipelining concepts with a prior knowledge of stored program methods
CO2	Design about memory hierarchy and mapping techniques
CO3	Understand parallel architecture and interconnection network

CO Attainment

		CO	**Attainment**
Computer Architecture (PCC-CS402)	**CO1**	Design pipelining concepts with a prior knowledge of stored program methods	10%
	CO2	Design about memory hierarchy and mapping techniques	25%
	CO3	Understand parallel architecture and interconnection network	25%

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			√	√						√		
CO2			√	√						√		
CO3					√		√					

Course Details

Course Name:	**Computer Architecture Lab**
Course Code:	**PCC-CS492**
Name of the Program:	**B.Tech**
Department	**Computer Science Engineering**
Semester	**4th Semester**

COURSE OUTCOME:

On successful completion of this course, students should be able to:

CO1	Design pipelining concepts with a prior knowledge of stored program methods
CO2	Design about memory hierarchy and mapping techniques
CO3	Understand of parallel architecture and interconnection network

CO Attainment

		CO	Attainment
Computer Architecture Lab (PCC-CS492)	**CO1**	Design pipelining concepts with a prior knowledge of stored program methods	10%
	CO2	Design about memory hierarchy and mapping techniques	25%
	CO3	Understand of parallel architecture and interconnection network	25%

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			√	√						√		
CO2			√	√						√		
CO3					√		√					

Course Details

Course Name:	Formal Language & Automata
Course Code:	PCC-CS403
Name of the Program:	B.Tech
Department	Computer Science Engineering
Semester	4th Semester

COURSE OUTCOME:

On successful completion of this course, students should be able to:

CO1	Formulate a formal notation for strings, languages and machines.
CO2	Design finite automata to accept a set of strings of a language
CO3	For a given language understand whether the given language is regular or not.
CO4	Design context free grammars to generate strings of context free language.
CO5	Understand equivalence of languages accepted by Push Down Automata and languages generated by context free grammars
CO6	Analyze the hierarchy of formal languages, grammars and machines.
CO7	Recognize between computability and non-computability and Decidability and undecidability.

CO Attainment

		CO	Attainment
Formal Language & Automata PCC-CS403)	**CO1**	Formulate a formal notation for strings, languages and machines.	**10%**
	CO2	Design finite automata to accept a set of strings of a language	**15%**
	CO3	For a given language understand whether the given language is regular or not.	**5%**
	CO4	Design context free grammars to generate strings of context free language.	**5%**
	CO5	Understand equivalence of languages accepted by Push Down Automata and languages generated by context free grammars	**10%**
	CO6	Analyze the hierarchy of formal languages, grammars and machines.	**10%**
	CO7	Recognize between computability and non-computability and Decidability and undecidability.	**5%**

MappingofCourseOutcomesandProgramOutcomesforthesubject**Formal Language & Automata**

PCC-CS403

CourseOutcomes	ProgramOutcomes											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		✓										
CO2			✓	✓						✓		
CO3					✓		✓					
CO4			✓	✓						✓		
CO5					✓		✓					
CO6		✓										
CO7												✓

Course Details

Course Name:	**DBMS**
Course Code:	**PCC-CS601**
Name of the Program:	**B.Tech**
Department	**Computer Science Engineering**
Semester	**6th Semester**

Course Outcome

On completion of the course students will be able to

1. Analyze a given query using relational algebra expressions and SQL for that query and optimize the developed expressions.

2. Design a given specification of the requirement design the databases using E R method and normalization.

3. Formulate a given transaction-processing system, determine the transaction atomicity, consistency, isolation, and durability.

4. Implement the isolation property, including locking, time stamping based on concurrency control and Serializability of scheduling.

CO Attainment

		CO	Attainment
DBMS	**CO1**	Analyze a given query using relational algebra expressions and SQL for that query and optimize the developed expressions.	20%
	CO2	Design a given specification of the requirement design the databases using E R method and normalization.	10%
	CO3	Formulate a given transaction-processing system, determine the transaction atomicity, consistency, isolation, and durability.	15%
	CO4	Implement the isolation property,	

		including locking, time stamping based on concurrency control and Serializability of scheduling.	14%

CO – PO Mapping

CourseOutcomes	ProgramOutcomes											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		✓										
CO2			✓	✓						✓		
CO3		✓										
CO4				✓								

Course Details

Course Name:	**DBMS LAB**
Course Code:	**PCC-CS691**
Name of the Program:	**B.Tech**
Department	**Computer Science Engineering**
Semester	**6th Semester**

COURSE OUTCOMES

1 Infer database language commands to create simple database.

2 Analyse the database using queries to retrieve records.

3 Applying PL/SQL for processing database.

4 Develop solutions using database concepts for real time requirements.

CO Attainment

DBMS LAB		CO	Attainment
	CO1	Understand HTML and Infer database language commands to create simple database.	10%
	CO2	Analyze the database using queries to retrieve records.	20%
	CO3	Applying PL/SQL for processing database.	15%
	CO4	Develop solutions using database concepts for real time requirements.	20%

CO – PO Mapping

CourseOutcomes	ProgramOutcomes											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1					✓		✓					
CO2		✓								✓		
CO3	✓				✓	✓					✓	
CO4							✓					

Course Details:

Course Name:	**Computer Networks**
Course Code:	**PCC-CS602**
Name of the Program:	**B.Tech**
Department	**Computer Science Engineering**
Semester	**6th Semester**

COURSE OUTCOME:

On successful completion of this course, students should be able to:

CO1	To develop an understanding of modern network s from a design and performance perspective.
CO2	To introduce the student to the major concepts involved in wide-area networks (WANs), local area networks (LANs) and Wireless LANs (WLANs)
CO3	To provide an opportunity to do network programming
CO4	To provide a WLAN measurement ideas.

CO Attainment

		CO	Attainment
Computer Networks (PCC-CS602)	CO1	To develop an understanding of modern network s from a design and performance perspective.	10%
	CO2	To introduce the student to the major concepts involved in wide-area networks (WANs), local area networks (LANs) and Wireless LANs (WLANs)	20%
	CO3	To provide an opportunity to do network programming	15%
	CO4	To provide a WLAN measurement ideas.	10%

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			√		√							
CO2	√	√			√							
CO3				√	√							
CO4				√	√							

Course Details:

Course Name:	ComputerNetworksLab
Course Code:	PCC-CS692
Name of the Program:	**B.Tech**
Department	**Computer Science Engineering**
Semester	**6th Semester**

COURSEOUTCOMES

Aftercompletionofcourse,studentswouldbeableto:

1. Identifyandusevariousnetworkingcomponents.
2. Analyzeperformance ofvariouscommunicationprotocols.
3. Understandthetransportlayerconceptsandprotocoldesignincludingconnectionorientedandconnection-less models.
4. Implementdevicesharingonnetwork.

COAttainmentofSubjects

Paper Code(Name)	**CO Number**	**Course Outcomes(CO)**	**ATTAINED**
ComputerNetworks Lab Code:PCC-CS692	CO1	Identify and understand of Various networking components.	10%
	CO2	Analyze the performance of Various communication protocols.	15%
	CO3	Understand the transport Layer concepts and Protocol design including Connection oriented and Connectionless models.	10%
	CO4	Implement device sharing On network.	20%

MappingofCourseOutcomesandProgramOutcomesforthesubjectComputerNetworkLab(PCC-CS692)

Course Outcomes	Program Outcomes											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		1					1					
CO2		1		1								
CO3							1					
CO4				1								

perCode (Name)	**CO Number**	**Course Outcomes(CO)**	**ATTAINED**
PROJ-CS601 Research Methodology	CO1	Identifyanddiscusstheissues andconcepts salienttotheresearch process.	15%
	CO2	Analysisofcomplex issuesinherentin selectingaresearch problem,selectingan appropriateresearch design,andimplementing aresearchproject.	20%
	CO3	Understand,compre hendand explainresearch articlesintheir academicdiscipline.	15%

MappingofCourseOutcomesandProgramOutcomesforthesubjectResearchMethodology(PROJ-CS601)

CourseOutcomes	ProgramOutcomes											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		✓										
CO2		✓		✓								
CO3							✓					

COAttainment

		CO	Attainment
Design and Analysis of Algorithm Lab (PCC-CS494)	**CO1**	Design algorithm and implement C program using divide and conquer approach in Computer Science and Engineering and related fields.	15%
	CO2	Design algorithm and implement C program using dynamic programming in Computer Science and Engineering and related fields.	15%
	CO3	Design algorithm and implement C program using branch and bound method in Computer Science and Engineering and related fields. App	5%
	CO4	Design algorithm and implement C program using backtracking in Computer Science and Engineering and related fields.	5%
	CO5	Design algorithm and implement C program using greedy method in Computer Science and Engineering and related fields.	10%
	CO6	Design Graph Traversal Algorithm and implement C program in Computer Science and Engineering and related fields.	15%

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			√	√						√		
CO2			√	√						√		
CO3			√	√						√		
CO4			√	√						√		
CO5			√	√						√		

Course Name:	**Image Processing**
Course Code:	**PEC-IT601D**
Name of the Program:	**B.Tech**
Department	**Computer Science Engineering**

Semester	**6th Semester**
Name of Faculty	**Suman Halder**

COURSE OUTCOME:
On successful completion of this course, students should be able to:

CO1	Review the fundamental concepts of a digital image processing system.
CO2	Analyze images in the spatial and frequency domain using various transforms.
CO3	Evaluate the techniques for image enhancement and image restoration.
CO4	Interpret image segmentation and representation techniques.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			√		√							
CO2	√	√			√							
CO3				√	√							
CO4				√	√							

Course Details

Course Name:	**Pattern Recognition**
Course Code:	**PEC-IT602D**
Name of the Program:	**B.Tech**
Department	**Computer Science Engineering**
Semester	**6th Semester**
Name of Faculty	**SD**

COURSE OUTCOME:
On successful completion of this course, students should be able to:

CO1	Understand and compare a variety of pattern classification, structural pattern recognition and pattern classifier combination techniques.
CO2	Summarize, analyze, and relate research in the pattern recognition area verbally and in writing.
CO3	Apply performance evaluation methods for pattern and critique comparisons of techniques made in the research literature.
CO4	Apply pattern recognition techniques to real-world problems such as document analysis and recognition.
CO5	Implement simple pattern classifiers, classifier combinations and structural pattern recognizers.
CO6	Able to manipulate Bayes' Classifier and implement Decision Trees.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1					√		√					
CO2		√		√								
CO3	√				√	√					√	
CO4	√				√	√					√	
CO5				√								

COAttainmentofSubjects

		CO	**Attainment**
Pattern Recognition PEC-IT602D	**CO1**	Understand and compare a variety of pattern classification, structural pattern recognition and pattern classifier combination techniques.	15%
	CO2	Summarize, analyze, and relate research in the pattern recognition area verbally and in writing.	15%
	CO3	Apply performance evaluation methods for pattern and critique comparisons of techniques made in the research literature.	5%
	CO4	Apply pattern recognition techniques to real-world problems such as document analysis and recognition.	15%
	CO5	Implement simple pattern classifiers, classifier combinations and structural pattern recognizers.	10%
	CO6	Able to manipulate Bayes' Classifier and implement Decision Trees.	5%

CO Attainment of Human Resource Development and Organizational Behavior(OEC-IT601B)

Paper Code(Name)	**CO Number**	**CourseOutcomes(CO)**	**ATTAINED**
OEC-IT601B	CO1	Understand the organizational structures, the Features and principles of organization. Analysis of the theories of motivation ,and Applying the knowledge in the organizational Level and in different socio-environmental Legal situations.	15%

Human Resource Development and Organizational Behavior	CO2	Understand and recognize different leadership in different social situations. Analysis of concept of Group Dynamic be done to the Students for their proper understanding and to apply in real-life scenarios.	15%
	CO3	Recognize the factors of organizational Change and its impact on business, better Understanding of the business environment With respect to resistance to change and apply The knowledge of it in different problems.	25%

Mapping of CourseOutcomes and ProgramOutcomesfor thesubjectHumanResourceDevelopmentandOrganizationalBehavior(OEC-IT601B)

CourseOutcomes	ProgramOutcomes											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		✓		✓			✓					
CO2		✓		✓			✓					
CO3							✓					✓

Cryptography & Network Security (CS801D)

Course Outcomes:

CO1: To be able to identify common network security vulnerabilities/attacks; explain the foundations of Cryptography and network security.

CO2: To be able to analyze the risks and threats to networked computers.

CO3: To be able to demonstrate detailed knowledge of the role of encryption to protect data.

CO4: To be able to analyze security issues arising from the use of certain types of technologies.

CO5: To be able to identify the appropriate procedures required to secure networks, system security testing and procedures of Backup and Recovery.

Paper Code(Name)	**CO Number**	**CourseOutcomes(CO)**	**ATTAINED**
OEC-IT601B HumanResource Developmentand OrganizationalBehavior	CO1	To be able to identify common network security vulnerabilities/attacks; explain the foundations of Cryptography and network security.	25%
	CO2	To be able to analyze the risks and threats to networked computers.	25%
	CO3	To be able to demonstrate detailed knowledge of the role of encryption to protect data.	20%

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		√										
CO2		√		√								
CO3	√	√				√	√					

CO4		√										

Course Details:

Course Name:	**E-Commerce & ERP**
Course Code:	**OEC-CS802A**
Name of the Program:	**B.Tech**
Department	**Computer Science Engineering**
Semester	**8th Semester**
Name of Faculty	**SD**

COURSE OUTCOME:

On successful completion of this course, students should be able to:

CO1	To identify and differentiate various types of Ecommerce.
CO2	To define and understand E-business and its Models.
CO3	To apply appropriate techniques and resources of Hardware and Software Technologies for Ecommerce.
CO4	To understand the basic concepts of ERP and identify different technologies used in ERP.
CO5	To apply different tools used in ER.

COAttainment

		CO	**Attainment**
E-Commerce & ERP OEC-CS802A	**CO1**	To identify and differentiate various types of Ecommerce.	10%
	CO2	To define and understand E-business and its Models.	15%
	CO3	To apply appropriate techniques and resources of Hardware and Software Technologies for Ecommerce.	10%
	CO4	To understand the basic concepts of ERP and identify different technologies used in ERP.	10%
	CO5	To apply different tools used in ER.	15%

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1				√								
CO2					√		√					
CO3	√				√	√					√	
CO4					√		√					
CO5	√				√	√					√	

PaperCode (Name)	**CO Number**	**Course Outcomes(CO)**	**ATTAINED**
OEC-CS801E, Soft Skill &Interpersonal Communication	CO1	Understand the importance of Behavioral aspects in the workplace	10%
	CO2	Recognize the conflict resolution skills at work	17%
	CO3	Understand the importance of Communication skills in daily life And at work	25%

Mapping of Course Outcomes and Program Outcomes for the subject Soft Skill &Interpersonal Communication(OEC-CS801E)

Course Outcomes	Program Outcomes											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1							✓					
CO2												✓
CO3							✓					

PAPER NAME	CO No.	Course Outcomes	Attainment
BIOLOGY (BSC-401)	CO1	Describe how biological observations of 18th century lead to major discoveries and understand that the classification of organisms is based on morphological, biochemical or ecological	10%

		parameters.	
	CO2	Highlight the concepts of excessiveness and dominance during the passage of genetic material from parent to offspring.	24%
	CO3	Convey that all forms of life have the same building blocks and yet the manifestations are diverse.	5%
	CO4	Classify enzymes and distinguish between different mechanisms of enzyme action and identify DNA as a genetic material in the molecular basis of information transfer.	10%
	CO5	Analyze biological processes at the reductionist level and apply thermodynamic principals to the biological systems.	10%

Mapping of Course Outcomes and Program Outcomes for the subject BIOLOGY (BSC-401)

Course Outcomes	Program Outcomes											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1					✓		✓					
CO2				✓			✓					✓
CO3		✓										✓
CO4												✓
CO4		✓										

PO NO.	BROAD	ELABORATE
1	Engineering knowledge	engineering fundam
2	Problem analysis:	Identify, formulate, research literature, and analyse complex engineering problems reaching substantiated conclusions usi
3	Design/development of	Design solutions for complex engineering problems and desig public health and safety, and cultural, societal, and environme
4	Conduct investigations of complex	Use research-based knowledge and research methods includ interpretation of data, and synthesis of the information to prov
5	Modern tool usage:	Create, select, and apply appropriate techniques, resources, a activities, with an understanding of the limitations.
6	The engineer and society:	Apply reasoning informed by the contextual knowledge to ass the professional engineering practice.
7	Environment and sustainability:	Understand the impact of the professional engineering solutio development.
8	Ethics:	Apply ethical principles and commit to professional ethics and
9	Individual and team work:	Function effectively as an individual, and as a member or lea
10	Communication:	Communicate effectively on complex engineering activities wi write effective reports and design documentation, make effect
11	Project management	Demonstrate knowledge and understanding of t h e engineer to manage projects and in multidisciplinary environments
12	Life-long learning:	Recognise the need for, and have the preparation and ability

PROGRAM SPECIFIC OUTCOMES

PSO1: Ability to apply the knowledge of Basic Computing, Basic Sciences and Social Sciences in the field of electrical engineering to identify, analyze and s life problems faced in industries and/or during research work.

PSO2: Ability to model, test, analyze and design components or processes rel modern power system involving both conventional and renewable energy reso voltage systems and energy management.

PSO3: Ability to apply the concept of circuit theory, electromagnetic field theo and basic electronics to solve complex problems of electrical machines and dri power electronic converters and electrical system design.

PSO4: Ability to identify and analyze the role of measurement, instrumentatic modern control engineering to enhance sustainability, reliability and efficiency electrical systems.
PSO5: Ability to demonstrate proficiency in operating and handling modern er tools to cop up with dynamic industrial environment.
PSO6: Ability to work and communicate effectively in the corporate life keepir responsible outlook towards socio-economic and environmental issues.

JRSE OUTCOMES

Nam

CO1	describe different type of networks, sources and signals with examples.
CO2	explain different network theorems, coupled circuit and tools for solution
CO3	apply network theorems and different tools to solve network problems.
CO4	select suitable techniques of network analysis for efficient solution.
CO5	estimate parameters of two-port networks.
CO6	design filter circuits.

Na

CO1	1. describe analog electronic components and analog electronics circuits
CO2	2. explain principle of operation of analog electronic components, filters,
CO3	3. compute parameters and operating points of analog electronic circuits.
CO4	4. determine response of analog electronic circuits.
CO5	5. distinguish different types amplifier and different types oscillators base
CO6	6. construct operational amplifier based circuits for different applications.

Name of

CO1	1. Relate different coordinate systems for efficient solution of electromag
CO2	2. describe mathematical s tools to solve electromagnetic problems.
CO3	3. explain laws applied to electromagnetic field.
CO4	4. apply mathematical tools and laws to solve electromagnetic problems.
CO5	5. analyze electromagnetic wave propagation
CO6	6. estimate transmission line parameters

Nam

Course	After completing this course, the students will be able to:
CO1	explain the co-ordinate system, principle of three dimensional rotation,kir
CO2	elaborate the theory of general motion, bending moment, torsional motio
CO3	develop free body diagram of different arrangements.

CO4	solve problems with the application of theories and principle of motion , fr
CO5	analyze torsional motion and bending moment.

N

CO1	explain basics of probability theories, rules, distribution and properties of
CO2	describe different methods of numerical analysis.
CO3	solve numerical problems based on probability theories , numerical analys
CO4	apply numerical methods to solve engineering problems.
CO5	5. solve engineering problems using z transform and probability theory.

Nam

Course	Upon completion of this course, students will be able to:
CO1	Describe with examples the biological observations lead to major discover
CO2	Explain the classification of kingdom of life the building blocks of life
CO3	Different techniques of bio physics used to study biological phenomena.
CO4	The role of imaging in the screening, diagnosis, staging, and treatments o
CO5	Identify DNA as a genetic material in the molecular basis of information t
CO6	Analyze biological processes at the reductionistic level.
CO7	Apply thermodynamic principles to biological systems.
CO8	Identify microorganisms..

Na

Course	After completing this course, the students will be able to:
CO1	Describe different features of Indian constitution.Power and functioning o
CO2	Identify authority to redress a problem in the profession and in the societ

Name o

Course	Up
CO1	Determine transient response of different electrical circuit, frequency res
CO2	Generate different signals in both discrete and analog form
CO3	Analyze amplitude and phase spectrum of different signals.
CO4	Verify network theorems.
CO5	Construct circuits with appropriate instruments and safety precautions.
CO5	Simulate electrical circuit experiments using suitable software.

Name

Course	Up
	At
CO1	Determine characteristics of full wave rectifier with filter and without filte
CO2	Verify function of DAC and ADC
CO3	Construct function generator using IC, R-C coupled amplifier,linear volta

CO4	Work in a team
CO5	Validate theoretical learning with practical Special Remarks: The above-m

Name

Course	Upon successful completion of the course, student will have:
CO1	Solve problems with Newton forward /backward, Lagrange's interpolatio
CO2	problems of numerical integration using Trapezoidal rule, Simpson's 1/3
CO3	rule, Weddle's rule problems to find numerical solution of a system of lin
CO4	Gauss elimination and Gauss-Seidel iterations. problems to find numerica
CO5	Ordinary differential equation by Euler's and Runga-Kutta methods.
CO6	Find appropriate numerical methods to solve engineering problems.
CO7	Use software package to solve numerical problems.

Na

Course	Up
CO1	Describe the function of different components of magnetic circuit, DC ma
CO2	Explain the principle of operation of different types of DC machines and tr
CO3	Solve numerical problems of DC machines and transformers.
CO4	Estimate the parameters and efficiency of transformer.
CO5	Determine the characteristics of DC machines
CO6	recommend methods to control output of DC machines.

Nam

Course	Up
CO1	Describe the function of different building blocks of digital electronics, ser
CO2	Explain the principle of operation of combinational and sequential digital c
CO3	Solve numerical problems of Boolean algebra, number system, combinati
CO4	Specify applications of combinational and sequential digital circuits.
CO5	Determine specifications of different digital circuits.
CO6	Design combinational and sequential digital circuits

Name of the S

Course	Up
CO1	Explain the terms accuracy, precision, resolution, speed of response, erro
CO2	Describe methods of measurement of power, energy by instruments and
CO3	Explain the principle of operation of analog meters, instrument transform
CO4	Explain the different building block, principle of operation of oscilloscope a
CO5	Solve numerical problems related to analog meters, instrument transform
CO6	Specify applications of analog and digital measuring instruments, sensors

Name o

Course	Upon successful completion of the course, student will have:

CO1	Describe the function of different components of boilers. Engines and turb
CO2	Explain the principle of operation of different types of boilers, turbines, IC
CO3	Solve numerical problems of boilers, turbines, IC engines and Gas turbine
CO4	Analyze the performance of boilers, engines and turbines.
CO5	Determine efficiency of boilers, engines and turbines.
CO6	Explain methods to control boiler, engines and turbines parameters.

Name of t

Course	Upon successful completion of the course, student will have:
CO1	1. Illustrate different aspects of human values, ethics, engineers' respons
CO2	2. Explain different principles, different theories and laws of engineering e
CO3	3. Identify different factors in the light of Engineers' responsibility toward
CO4	4. Correlate ethics of different work environment.
CO5	5. Explain the need for intellectual property rights.

Name

Course	Upon successful completion of the course, student will have:
CO1	Understand the natural environment and its relationships with human ac
CO2	Apply the fundamental knowledge of science and engineering to assess e
CO3	Develop guidelines and procedures for health and safety issues obeying th
CO4	Acquire skills for scientific problem-solving related to air, water, noise& la

Name of t

Course	Upon successful completion of the course, student will have:
CO1	Identify appropriate equipment and instruments for the experiment.
CO2	Test the instrument for application to the experiment.
CO3	Construct circuits with appropriate instruments and safety precautions
CO4	Validate different characteristics of DC machine , methods of speed contr
CO5	Work effectively in a team

Name of t

Course	Upon successful completion of the course, student will have:
CO1	Identify appropriate equipment and instruments for the experiment
CO2	2. Test the instruments for application to the experiment
CO3	3. Construct decoder , multiplexer, adder and subtractor circuits with app
CO4	4. Realize RS-JK and D flip flop, universal register with gates, multiplexer
CO5	5. Validate the operation of code conversion circuit –BCD to Excess 3 & vi
CO5	Work effectively in a team

Name of the Subjec

Course	Upon successful completion of the course, student will have:
	1. identify appropriate equipment and instruments for the experiment

	2. test the instrument for application to the experiment
	3. construct circuits with appropriate instruments and safety precautions
	4. evaluate and adjust the precision and accuracy of AC energy meter, m
	5. measure voltage, current, power, energy, phase , frequency, resistanc
	6. work effectively in a team

Name of the S

Course	Upon successful completion of the course, student will have:
CO1	Identify appropriate equipment and instruments for the experiment
CO2	Construct experimental setup with appropriate instruments and safety pr
CO3	Identify different parts of Lanchashire Boiler, Bahcock & Willcox Boiler, Co
CO4	Test 4 stroke petrol engine by electrical load box and diesel engine by ele
CO5	Find calorific value, flash point, fire point, cloud point, pour point of fuel.
C06	Work effectively in a team

Name of t

Course	On successful completion of the course the student will be able to:
	1. To understand the arrangement of windings of AC machines.
	2. To understand the principle of production of pulsating and revolving m
	3. To understand the principle of operation and characteristics of three ph
	4. To understand the principle of operation and characteristics of single p
	5. To understand the principle of operation and characteristics of synchro
	6. To understand the principle of operation and characteristics of special e
	7. To solve problems of Induction machines, synchronous machines and s

I

Course	After completion of this course the students will be able to:
CO1	To understand the basic principle of generation of Electricity from differen
CO2	To find parameters and characteristics of overhead transmission lines and
CO3	To find different parameters for the construction of overhead transmissio
CO4	To determine the performance of transmission lines.
CO5	To understand the principle tariff calculation.
CO6	To solve numerical problems on the topics studied.

N

Course	On completion of this course a student will be in a position to:
CO1	1. To find mathematical representation of LTI systems.
CO2	2. To find time response of LTI systems of different orders
CO3	3. To find the frequency response of LTI systems of different orders
CO4	4. To understand stabilityof differentLTI systems.
CO5	5. To analyze LTIsystems with state variables.
CO6	6. To solve problems of mathematical modelling and stability of LTI syste

Na

Course	On completion of this course a students will be able to
CO1	To understand the functioning and characteristics of power switching dev
CO2	To understand the principle of operation of converters.
CO3	To understand different triggering circuits and techniques of commutatior
CO4	To find external performance parameter of converters.
CO5	To analyze methods of voltage control, improvement of power factor and
CO6	To solve numerical problems of converters

Name of

Course	After completion of the course, the students will be able to:
CO1	identify appropriate equipment and instruments for the experiment.
CO2	test the instrument for application to the experiment.
CO3	construct circuits with appropriate instruments and safety precautions.
CO4	validate different characteristics of single phase Induction motor, three ph
CO5	work effectively in a team

Name c

Course	On completion of this course a students will be able to
CO1	identify appropriate equipment and instruments for the experiment.
CO2	test the instrument for application to the experiment.
CO3	3. construct circuits with appropriate instruments and safety precautions.
CO4	4. validate different characteristics of transmission line.
CO5	5. determine earth resistance, dielectric strength of insulating oil, breakd
CO6	6. analyze an electrical transmission line circuit with the help of software
CO7	7. work effectively in a team

Name c

Course	After completion of this course the students will be able to
CO1	identify appropriate equipment and instruments for the experiment.
CO2	test the instrument for application to the experiment.
CO3	construct circuits with appropriate instruments and safety precautions.
CO4	use MAT-Lab control system tool box, MAT-Lab- simulink tool box & PSPI
CO5	5. determinecontrol system specifications of first and second order syster

Name of

Course	On completion of this course a students will be able to
CO1	identify appropriate equipment and instruments for the experiment.
CO2	test the instrument for application to the experiment.
CO3	construct circuits with appropriate instruments and safety precautions

Name o

Course	On completion of this course a student will be in a position to:
CO1	differentiate how the choices of data structure & algorithm methods enha
CO2	solve problems based upon different data structure & also write programs
CO3	write programs based on different data structure
CO4	identify appropriate data structure & algorithmic methods in solving probl
CO5	discuss the computational efficiency of the principal algorithms for sortinc
CO6	comparethe benefits of dynamic and static data structures implementatio

Name of

Year: 3rd

Course	After completion of this course the students will be able to
CO1	specify simple abstract data types.
CO2	recognise features of object-oriented design such as encapsulation, polyn
CO3	inheritance, and composition of systems based on object identity.
CO4	apply common object-oriented design patterns
CO5	specify uses of common object oriented design patterns with examples.
CO6	design applications with an event-driven graphical user interface.

N

Course	After completion of the course, the students will be able to:
CO1	Represent power system components in line diagrams.
CO2	Determine the location of distribution substation.
CO3	Determine the performance of power system with the help of load flowv s
CO4	Analyse faults in Electrical systems.
CO5	Determine the stabilty of Power system.
CO6	Explain principle of operation of different power system protection equipn
CO7	Solve numerical problems related to representation, load flow, faults, stal

Name of th

Year: 3rd

Course	After completion of the course, the students will be able to
CO1	1. explain the architecture of 8086 and 8051.
CO2	2. do assembly language programming of 8086, 8051
CO3	3. interface different peripheral with 8086 and 8051
CO4	4. develop micro processor/ microcontroller based systems.
CO5	5. compare microprocessor, microcontroller, PIC and ARM processors

Nam

Course	On completion of this course a students will be able to
CO1	explain the principle of sampling and reconstrction of analog signal. syst
CO2	perform Z-transformation and inverse Z-tranaformation of systems.
CO3	analyse and design digital control
CO4	design compensators for digital control system to achieve desired specifi

CO5	represent digital control systems using state space models.
CO6	analyze the effect sampling on stability, controllability and observability

Na

Course	A
CO1	choose intelligently AC and DC transmission systems for the dedicated ap
CO2	identify the suitable two-level/multilevel configuration for high power cor
CO3	select the suitable protection method for various converter faults.
CO4	4. identify suitable reactive power compensation method.
CO5	5. decide the configuration for harmonic mitigation on both AC and DC sic
CO6	6. solve numerical problems related to converters, power flow analysis, re

Name

Course	After completion of this course the students will be able to
CO1	specify the rating of electrical machines with standard specifications.
CO2	explain the principles of electrical machine design and carry out basic des
CO3	3. determine the various factors which influence the design of electrical, r
CO4	4. explain the construction and performance characteristics of electrical m
CO5	5. use software tools to do design calculations.

Name of

Course	On completion of this course a students will be able to
CO1	explain the principle of Electric traction.
CO2	choose a suitable drive scheme for developing an electric hybrid vehicle d
CO3	design and develop basic schemes of electric vehicles and hybrid electric
CO4	choose proper energy storage systems for vehicle applications
CO5	implement different energy management strategies for hybrid vehicle.

Name

Course Outcomes	analyse uncompensated AC transmission line. explain the working principles of FACTS devices and their operating chara 3. apply FACTS devices for power flow control and stabilty. 4. identify different issues of power quality in distribution system. 5. apply different compensation and control techniques for DSTATCOM6.
Name of the Subject: INDUSTRIAL ELECTRICALSYSTEMS	
Subject Code: PE-EE-602C	
Year: 3rd	
Course Outcomes	1. Represent electrical wiring system for residential, commercial and indu 2. Determine the rating of components of residential and commercial elec 3. Design lighting scheme for a residential and commercial premises. 4. Select transformer, switchgear, protection equipments for industrial el 5. explain methods of automation of Industrial Electrical Systems 6. Solve numerical problems related to earthing system, lighting scheme,

Name of the Subject: DIGITAL SIGNALPROCESSING

Subject Code: PE-EE-601A

Year: 3rd

Course Outcomes	1. represent signals mathematically in continuous and discrete-time and i 2. analyse discrete-time systems using z-transform. 3. explain the Discrete-Fourier Transform (DFT) and the FFT algorithms. 4. design digital filters for various applications. 5. apply digital signal processing for the analysis of real-life signals.

Name of the Subject: COMMUNICATION ENGINEERING

Subject Code: PE-EE-601B

Year: 3rd

Course Outcomes	1. compare the performance of AM, FM and PM schemes with reference to 2. explain noise as a random process and its effect on communication rec 3. evaluate the performance of ASK, FSK, PSK, BPSK, QPSK in a digital co 4. identify source coding and channel coding schemes for a given commu 5. analyze various digital modulation methods 6. compute band width requirement and probability of error in various dig

Name of the Subject: VLSI AND MICROELECTRONICS

Subject Code: PE-EE-603C

Year: 3rd

Course Outcomes	1. explain the principle of design of VLSI circuits 2. explain different MOS structure with characteristics 3. apply different processes for VLSI fabrication 4. use programming language for the design of logic circuits 5. draw the stick diagram and layout for simple MOS circuits

Name of the Subject: ECONOMICS FOR ENGINEERS

Subject Code: HM-EE-601

Year: 3rd

Course Outcomes	1. evaluate the economic theories, cost concepts and pricing policies 2. explain the market structures and integration concepts 3. apply the concepts of financial management for project appraisal 4. explain accounting systems , the impact of inflation, taxation, depreciа 5. analyze financial statements using ratio analysis 6. explain financial planning, economic basis for replacement, project sch

Name of the Subject: POWER SYSTEM-II LABORATORY

Subject Code: PC-EE 691

Year: 3rd

Course Outcomes	1. Identify appropriate equipment and instruments for the experiment. 2. Test the instrument for application to the experiment. 3. Construct circuits with appropriate instruments and safety precautions 4. Validate the characteristics of under voltage relay, over current relay, (5. Validate protection schemes of transformer, generator, motor and feed 7. work effectively in a team

Name of the Subject: MICRO PROCESSOR AND MICRO CONTROLLERLABORATORY

Subject Code: : PC-EE 692

Year: 3rd

Course	1. identify appropriate equipment and instruments for the experiment

Outcomes	2. test the instrument for application to the experiment 3. construct circuits with appropriate instruments and safety precautions 4. program 8086 for arithmatic operation, sorting of array, searching for 5. interface ADC/DAC, 8255, 8251 to 8086 and LCD, keyboard to 8051 6. program 8051 using arithmatic, logical and bit manipulation instructior 7. work effectively in a team

Name of the Subject: ELECTRICAL AND ELECTRONICS DESIGNLABORATORY

Subject Code: PC-EE 681

Year: 3rd

Course Outcomes	1. explain basic concept of measurement, noise in electronic system, sens 2. implement PC based data acquisition systems 3. construct circuits with appropriate instruments and safety precautions 4. design heating elements, air core grounding reactor, power distributior 5. do wiring and installation design of a multistoried residential building w 6. design electronic hardware for controller of lift, speed of AC/DC motor,

Name of the Subject: ELECTRIC DRIVE

Subject Code: PC-EE 701

Year: 4TH

Course Outcomes	1. Explain the principle of operation of Electric Drive. 2. Describe different methods of starting and braking of Electric Drive. 3. Model and control DC Drive 4. Control speed of Induction and Synchronous motors. 5. Recommend drives for different applications. 6. Estimate ratings, variables and parameters of Electric Drives.

Name of the Subject: CONTROL SYSTEM DESIGN

Subject Code: PE-EE 701 A

Year: 4TH

Course Outcomes	1. explain the effect of gain, addition of pole and zeros on system's perfor 2. describe time domain and frequency domain design specifications. 3. demonstrate the effect of nonlinearity on system performance. 4. design control system in time domain , in frequency domain and in sta 5. design PID controllers. 6. select appropriate method for design of control system.

Name of the Subject: ELECTRICAL ENERGY CONSERVATION& AUDITING

Subject Code: : PE-EE 701B

Year: 4TH

Course Outcomes	1. explain the basic of energy resources, energy security, energy conserv 2. quantify the energy conservation opportunities in different thermal sys 3. quantify the energy conservation opportunities in different electrical sy 4. identify the common energy conservation opportunities in different ene 5. explain the methods of energy management and audit. 6. analyse and report the outcome of energy audit

Name of the Subject: POWER GENERATION ECONOMICS

Subject Code: : PE-EE 701C

Year: 4TH

Course	1. explain the different terms e.g. load factor etc for economics of genera

Outcomes	2. apply different types of tariff for electricity pricing. 3. optimize the operation of power system with unit commitment. 4. determine generation levels such that the total cost of generation beco 5. determine the state of the system given by the voltage magnitudes an 6. predict the power or energy needed to balance the supply and load de

Name of the Subject: ARTIFICIAL INTELLIGENCE

Subject Code: OE-EE-701A

Year: 4TH

Course Outcomes	1. explain the concept of knowledge representation and predicate logic ar 2. describe state space and its searching strategies 3. demonstrate profciency in applying scientifc method to models of mach 4. apply the machine learning concepts in real life problems 5. demonstrate an ability to share in discussions of AI, its current scope a

Name of the Subject: INTERNET OF THINGS

Subject Code: OE-EE-701B

Year:4TH

Course Outcomes	1. explain the definition and usage of the term "Internet of Things" in diff 2. explain the key components that make up an IoT system. 3. differentiate between the levels of the IoT stack and be familiar with t 4. build and test a IoT system involving prototyping, programming and da 5. apply cloud computing and data analytics in a typical IoT system

Name of the Subject: COMPUTER GRAPHICS

Subject Code: OE-EE-701C

Year: 4TH

Course Outcomes	1. explain Computer graphics and graphic systems. 2. test and implement line drawing algorithm, circle and ellipse drawing a 3. Perform 2D and 3D transformation and viewing. 4. apply algorithms for visible surface determination. 5. explain colors and shading models and ray tracing.

Name of the Subject: EMBEDDED SYSTEM

Subject Code: OE-EE 702A

Year: 4TH

Course Outcomes	1. discuss the definition, purpose, application, classification , quality char 2. explain the internal structure of the Embedded system. 3. interface IO devices and other peripherals with micro controllers in Em 4. write programs for Micro controllers in Embedded systems. 5. apply the concept of Embedded firmware in design of Embedded syste

Name of the Subject: DIGITAL IMAGE PROCESSING

Subject Code: OE-EE 702B

Year: 4TH

Course Outcomes	1. explain the fundamental concepts of a digital image processing system 3. apply different image segmentation techniques. 4. categorize various compression techniques. 5. implement image process and analysis algorithms. 6. apply image processing algorithms in practical applications.

Name of the Subject: COMPUTER NETWORK

Subject Code: : OE-EE 702C

Year: 4TH

Course Outcomes	1. explain the concepts of data communication and networking. 2. identify the different types of network topologies and protocols. 3. describe the function of a network system with OSI and TCP/IP model. 4. differentiate different types of routing protocol. 5. apply principles of congestion control . 6. implement different schemes for security of the networks.

Name of the Subject: PRINCIPLE OF MANAGEMEENT

Subject Code: : HM-EE 701

Year: 4TH

Course Outcomes	1. explain the concepts and approaches of management. 2. demonstrate the roles, skills and functions of management. 3. diagnose and solve organizational problems. 4. identify the complexities associated with management of human resou 5. apply different methods of Customer, Operation and Technology mana 6. acquire skills of good leader in an organization.

Name of the Subject: ELECTRIC DRIVE LABORATORY

Subject Code: PC-EE 791

Year: 4TH

Course Outcomes	1. identify appropriate equipment and instruments for the experiment. 2. test the instrument for application to the experiment. 3. construct circuits with appropriate instruments and safety precautions. 4. apply different methods of control of Electric Drive in the laboratory. 5. analyse experimental data obtained in the laboratory. 6. work effectively in a team

Name of the Subject: UTILIZATION OF ELECTRIC POWER

Subject Code: : PC-EE 801

Year: 4TH

Course Outcomes	1. explain the fundamentals of illumination and different lighting schemes 3. able to select appropriate lighting, heating and welding techniques for 4. apply different electrolysis process for different applications. 5. explain the principle of different aspect of Electric traction and control

Name of the Subject: LINE COMMUTATED AND ACTIVE PWM RECTIFIERS

Subject Code: PE-EE 801A

Year: 4TH

Course Outcomes	1. explain the principle of operation of different converters. 2. suggest the application of different filters. 3. apply converters for different applications. 4. analyze converter circuits. 5. develop appropriate scheme for control of different converters. 6. solve numerical problems relating to different converters.

Name of the Subject: POWER SYSTEM DYNAMICS AND CONTROL

Subject Code: PE-EE 801B

Year: 4TH

Course Outcomes	1. explain the model of power system components 2. select the appropriate model for required analysis. 3. analyze the performance of the system with small signal analysis.

	4. evaluate the stability of the single and multi machine systems. 5. develop measures for enhancing the stability of the system. 6. Solve numerical problems of linear dynamical system, modeling of diffe
Name of the Subject: ADVANCED ELECTRIC DRIVE	
Subject Code: PE-EE 801C	
Year: 4TH	
Course Outcomes	1. explain the principle of operation of converters for AC drives. 2. model Induction and Synchronous motor by reference frame theory. 3. apply different control methods to control speed and torque of Inductic 4. explain the configurations and method of speed control of BLDC, PMSM 5. realize basic blocks for DSP based motion control. 6. develop appropriate scheme for speed control of Induction and Synchr
Name of the Subject: INDUSTRIAL AUTOMATION AND CONTROL	
Subject Code: : PE-EE 801D	
Year: 4TH	
Course Outcomes	1. explain the basic structure of industrial automation and control 2. classify different types of control actions of controllers. 3. analyze control strategies of different processes of industry. 4. illustrate the construction and use of different types of actuators and c 5. use PLC, DCS and SCADA in advanced industrial control.
Name of the Subject: SOFT COMPUTING TECHNIQUES	
Subject Code: OE-EE 801A	
Year: 4TH	
Course Outcomes	1. explain soft computing techniques and their roles in building intelligent 2. anlyse the feasibility of application of soft computing techniques for a p 3. effectively use existing software tools to solve real problems using a sc 4. evaluate solutions by various soft computing approaches for a given pr 5. apply different soft computing techniques to solve Engineering problem
Name of the Subject: BIOMEDICAL INSTRUMENTATION	
Subject Code: OE-EE 801B	
Year: 4TH	
Course Outcomes	1. describe the principle of medical transducers for temperature, pressure 2. explain the principle of operation of Biomedical recorders, Medical Ima 3. use different Medical laboratory equipments for different tests . 4. analyze any measurement application and suggest suitable measurem 5. suggest suitable imaging methodology for a specific ailment.
Name of the Subject: INTRODUCTION TO MACHINE LEARNING	
Subject Code: OE-EE 801C	
Year: 4TH	
Course Outcomes	1. explain the basics concepts and classification of Machine Learning . 2. write simple programs using python. 3. describe Supervised Learning concepts. 4. explain the concept of Support Vector Machine. 5. describe unsupervised learning concepts and dimensionality reduction 6. apply Machine Learning in a range of real-world applications .
Name of the Subject: SENSORS AND TRANSDUCERS	
Subject Code: OE-EE 801D	

Year: 4TH

Course Outcomes	1. explain the basic principle of operation of Transducers and Sensors. 2. distinguish different sensors and transducers. 3. identify suitable transducer by comparing different industrial standards 4. estimate the performance of different transducers. 5. design real life electronics and instrumentation measurement systems

PROGRAMME OUTCOMES (PO) BASED ON G.A.

		PO1	PO2	PO3	PO4
Course Outcomes	CO1	0.67	0.67	0.67	0.67
	CO2	0.67	0.67	0.67	0.67
	CO3	0.67	0.67	0.67	
	CO4	0.67	0.67	0.67	0.67
	CO5	0.67	0.67	0.67	
	CO6	0.67	0.67	0.67	0.67
Course Outcomes	CO1	0.66	0.66	0.66	0.66
	CO2	0.66	0.66	0.66	0.66
	CO3	0.66	0.66	0.66	
	CO4	0.66	0.66	0.66	0.66
	CO5	0.66	0.66	0.66	
	CO1	0.74	0.74	0.74	0.74
Course Outcomes	CO2	0.74	0.74	0.74	0.74
	CO3	0.74	0.74	0.74	0.74
	CO4	0.74	0.74	0.74	0.74
	CO5	0.74	0.74	0.74	0.74
	CO6	0.74	0.74	0.74	0.74

	CO1	0.77	0.77	0.77	0.77
Course Outcomes	CO2	0.77	0.77	0.77	0.77
	CO3	0.77	0.77	0.77	0.77
	CO4	0.77	0.77	0.77	0.77
	CO5	0.77	0.77	0.77	0.77
	CO1	0.78	0.78		0.78
	CO2	0.78	0.78		0.78
Course Outcomes	CO3	0.78	0.78		0.78
	CO4	0.78	0.78		0.78
	CO5	0.78	0.78		0.78
	CO6	0.78	0.78		0.78
	CO1	0.75			
	CO2	0.75			0.75
Course Outcomes	CO3	0.75			0.75
	CO4	0.75			0.75
	CO5	0.75			0.75
	CO6	0.75			0.75
	CO1	0.92			
	CO2				
Course Outcomes	CO1	0.9	0.9	0.9	0.9
	CO2	0.9	0.9	0.9	0.9
	CO3	0.9	0.9	0.9	
	CO4	0.9	0.9	0.9	0.9
	CO5	0.9	0.9	0.9	
	CO6	0.9	0.9	0.9	0.9
Course Outcomes	CO1	0.89	0.89	0.89	0.89
	CO2	0.89	0.89	0.89	0.89
	CO3	0.89	0.89	0.89	
	CO4	0.89	0.89	0.89	0.89
	CO5	0.89	0.89	0.89	
	CO1	0.84	0.84		0.84
Course Outcomes	CO2	0.84	0.84		0.84
	CO3	0.84	0.84		0.84
	CO4	0.84	0.84		0.84
	CO5	0.84	0.84		0.84
	CO6	0.84	0.84		0.84
	CO1	0.87	0.87	0.87	0.87
Course Outcomes	CO2	0.87	0.87	0.87	0.87
	CO3	0.87	0.87		
	CO4	0.87	0.87		
	CO5	0.87	0.87		
	CO6	0.87	0.87	0.87	0.87
	CO1	0.76	0.76	0.76	0.76
Course Outcomes	CO2	0.76	0.76	0.76	0.76
	CO3	0.76	0.76	0.76	
	CO4	0.76	0.76	0.76	
	CO5	0.76	0.76	0.76	0.76

	CO6	0.76	0.76	0.76	0.76
	CO1	0.72	0.72	0.72	0.72
Course Outcomes	CO2	0.72	0.72	0.72	
	CO3	0.72	0.72	0.72	
	CO4	0.72			
	CO5	0.72			0.72
	CO6	0.72	0.72	0.72	
	CO1	0.71	0.71	0.71	0.71
Course Outcomes	CO2	0.71	0.71		
	CO3	0.71	0.71	0.71	
	CO4	0.71			
	CO5	0.71			0.71
	CO6	0.71	0.71	0.71	0.71
	CO1	0.88	0.88	0.88	0.88
Course Outcomes	CO2	0.88	0.88	0.88	
	CO3	0.88	0.88	0.88	
	CO4	0.88			
	CO5	0.88			0.88
	CO6	0.88	0.88	0.88	0.88
	CO1	0.95	0.95	0.95	0.95
Course Outcomes	CO2	0.95	0.95	0.95	
	CO3	0.95	0.95	0.95	
	CO4	0.95			
	CO5	0.95			0.95
	CO6	0.95	0.95	0.95	0.95
	CO1	0.76	0.76	0.76	0.76
Course Outcomes	CO2	0.76	0.76		
	CO3	0.76	0.76	0.76	
	CO4	0.76			
	CO5	0.76			0.76
	CO6	0.76	0.76	0.76	0.76
	CO1	0.92	0.92	0.92	0.92
Course Outcomes	CO2	0.92	0.92	0.92	
	CO3	0.92	0.92	0.92	
	CO4	0.92			
	CO5	0.92			0.92
	CO6	0.92	0.92	0.92	0.92
	CO1	0.91	0.91	0.91	0.91
Course Outcomes	CO2	0.91	0.91	0.91	
	CO3	0.91	0.91	0.91	
	CO4	0.91			
	CO5	0.91			0.91
	CO6	0.91	0.91	0.91	0.91
	CO1	0.87	0.87	0.87	0.87
Course Outcomes	CO2	0.87	0.87	0.87	
	CO3	0.87	0.87	0.87	
	CO4	0.87			

	CO5	0.87			0.87
	CO6	0.87	0.87	0.87	0.87
	CO1	0.67	0.67	0.67	
Course Outcomes	CO2	0.67			0.67
	CO3	0.67			0.67
	CO4				0.67
	CO5		0.67	0.67	
	CO6	0.67	0.67	0.67	
	CO1	0.84	0.84	0.84	
Course Outcomes	CO2	0.84			0.84
	CO3	0.84			0.84
	CO4				0.84
	CO5		0.84	0.84	
	CO6	0.84	0.84	0.84	
	CO1	0.71	0.71	0.71	
Course Outcomes	CO2	0.71			0.71
	CO3	0.71			0.71
	CO4				0.71
	CO5		0.71	0.71	
	CO6	0.71	0.71	0.71	
	CO1	0.92	0.92	0.92	
Course Outcomes	CO2	0.92			0.92
	CO3	0.92			0.92
	CO4				0.92
	CO5		0.92	0.92	
	CO6	0.92	0.92	0.92	
	CO1	0.63	0.63	0.63	
Course Outcomes	CO2	0.63			0.63
	CO3	0.63			0.63
	CO4				0.63
	CO5		0.63	0.63	
	CO6	0.63	0.63	0.63	
	CO1	0.87	0.87	0.87	
Course Outcomes	CO2	0.87			0.87
	CO3	0.87			0.87
	CO4				0.87
	CO5		0.87	0.87	
	CO6	0.87	0.87	0.87	
	CO1	0.68	0.68	0.68	
Course Outcomes	CO2	0.68			
	CO3	0.68			
	CO4				
	CO5		0.68	0.68	
	CO6	0.68	0.68	0.68	
	CO1	0.83	0.83	0.83	
Course Outcomes	CO2	0.83			
	CO3	0.83			

	CO4				
	CO5		0.83	0.83	
	CO6	0.83	0.83	0.83	
	CO1	NA	NA	NA	NA
Course Outcomes	CO2	NA	NA	NA	NA
	CO3	NA	NA	NA	NA
	CO4	NA	NA	NA	NA
	CO5	NA	NA	NA	NA
	CO6	NA	NA	NA	NA
	CO1		0.83	0.83	0.83
Course Outcomes	CO2	0.83	0.83		
	CO3	0.83	0.83		
	CO4	0.83			
	CO5	0.83		0.83	0.83
	CO6	0.83	0.83	0.83	0.83
	CO1	0.71	0.71	0.71	0.71
Course Outcomes	CO2	0.71	0.71		
	CO3	0.71	0.71		
	CO4	0.71			
	CO5	0.71		0.71	0.71
	CO6	0.71	0.71	0.71	0.71
	CO1	0.68	0.68	0.68	0.68
Course Outcomes	CO2	0.68	0.68		
	CO3	0.68	0.68		
	CO4	0.68			
	CO5	0.68		0.68	0.68
	CO6	0.68	0.68	0.68	0.68
	CO1	NA	NA	NA	NA
Course Outcomes	CO2	NA	NA	NA	NA
	CO3	NA	NA	NA	NA
	CO4	NA	NA	NA	NA
	CO5	NA	NA	NA	NA
	CO6	NA	NA	NA	NA
	CO1	0.73	0.73	0.73	0.73
Course Outcomes	CO2	0.73	0.73		
	CO3	0.73	0.73		
	CO4	0.73			
	CO5	0.73		0.73	0.73
	CO6	0.73	0.73	0.73	0.73
	CO1	0.89	0.89	0.89	0.89
Course Outcomes	CO2	0.89	0.89		
	CO3	0.89	0.89		
	CO4	0.89			
	CO5	0.89		0.89	0.89
	CO6	0.89	0.89	0.89	0.89
	CO1	0.65	0.65	0.65	0.65
Course	CO2	0.65	0.65		

Outcomes	CO3	0.65	0.65		
	CO4	0.65	0.65		
	CO5	0.65	0.65	0.65	0.65
	CO6	0.65	0.65	0.65	0.65
	CO1	0.89	0.89	0.89	0.89
Course Outcomes	CO2	0.89	0.89		
	CO3	0.89	0.89		
	CO4	0.89	0.89		
	CO5	0.89	0.89	0.89	0.89
	CO6	0.89	0.89	0.89	0.89
	CO1	0.92	0.92	0.92	0.92
Course Outcomes	CO2	0.92	0.92		
	CO3	0.92	0.92		
	CO4	0.92	0.92		
	CO5	0.92	0.92	0.92	0.92
	CO6	0.92	0.92	0.92	0.92
	CO1	0.68	0.68	0.68	0.68
Course Outcomes	CO2	0.68			0.68
	CO3	0.68			0.68
	CO4	0.68			0.68
	CO5	0.68	0.68	0.68	0.68
	CO6	0.68	0.68	0.68	0.68
	CO1	NA	NA	NA	NA
Course Outcomes	CO2	NA	NA	NA	NA
	CO3	NA	NA	NA	NA
	CO4	NA	NA	NA	NA
	CO5	NA	NA	NA	NA
	CO6	NA	NA	NA	NA
	CO1	NA	NA	NA	NA
Course Outcomes	CO2	NA	NA	NA	NA
	CO3	NA	NA	NA	NA
	CO4	NA	NA	NA	NA
	CO5	NA	NA	NA	NA
	CO6	NA	NA	NA	NA
	CO1	0.9	0.9	0.9	0.9
Course Outcomes	CO2	0.9	0.9	0.9	0.9
	CO3	0.9	0.9		
	CO4	0.9	0.9		
	CO5	0.9	0.9	0.9	0.9
	CO6	0.9	0.9	0.9	0.9
	CO1	NA	NA	NA	NA
Course Outcomes	CO2	NA	NA	NA	NA
	CO3	NA	NA	NA	NA
	CO4	NA	NA	NA	NA
	CO5	NA	NA	NA	NA
	CO6	NA	NA	NA	NA
	CO1	0.87	0.87	0.87	0.87

Course Outcomes	CO2	0.87	0.87	0.87	0.87
	CO3	0.87			0.87
	CO4	0.87	0.87	0.87	0.87
	CO5	0.87			
	CO6	0.87	0.87	0.87	0.87
	CO1	0.86	0.86	0.86	0.86
Course Outcomes	CO2	0.86	0.86	0.86	0.86
	CO3	0.86	0.86	0.86	0.86
	CO4	0.86	0.86		0.86
	CO5	0.86	0.86		0.86
	CO6	0.86	0.86		0.86
	CO1	0.83	0.83	0.83	0.83
Course Outcomes	CO2	0.83	0.83		
	CO3	0.83			
	CO4	0.83	0.83	0.83	0.83
	CO5	0.83	0.83	0.83	
	CO6	0.83	0.83	0.83	
	CO1	0.92	0.92	0.92	0.92
Course Outcomes	CO2	0.92	0.92		
	CO3	0.92			
	CO4	0.92	0.92	0.92	0.92
	CO5	0.92	0.92	0.92	
	CO6	0.92	0.92	0.92	
	CO1	NA	NA	NA	NA
Course Outcomes	CO2	NA	NA	NA	NA
	CO3	NA	NA	NA	NA
	CO4	NA	NA	NA	NA
	CO5	NA	NA	NA	NA
	CO6	NA	NA	NA	NA
	CO1	NA	NA	NA	NA
Course Outcomes	CO2	NA	NA	NA	NA
	CO3	NA	NA	NA	NA
	CO4	NA	NA	NA	NA
	CO5	NA	NA	NA	NA
	CO6	NA	NA	NA	NA
	CO1	0.82	0.82	0.82	
Course Outcomes	CO2	0.82	0.82	0.82	
	CO3	0.82	0.82	0.82	
	CO4	0.82	0.82	0.82	
	CO5	0.82	0.82	0.82	
	CO6	0.82	0.82	0.82	
	CO1	0.84	0.84	0.84	0.84
Course Outcomes	CO2	0.84	0.84	0.84	0.84
	CO3	0.84			
	CO4	0.84			
	CO5	0.84	0.84	0.84	0.84
	CO6	0.84	0.84	0.84	0.84

	CO1	NA	NA	NA	NA
Course Outcomes	CO2	NA	NA	NA	NA
	CO3	NA	NA	NA	NA
	CO4	NA	NA	NA	NA
	CO5	NA	NA	NA	NA
	CO6	NA	NA	NA	NA
	CO1	NA	NA	NA	NA
Course Outcomes	CO2	NA	NA	NA	NA
	CO3	NA	NA	NA	NA
	CO4	NA	NA	NA	NA
	CO5	NA	NA	NA	NA
	CO6	NA	NA	NA	NA
	CO1	NA	NA	NA	NA
Course Outcomes	CO2	NA	NA	NA	NA
	CO3	NA	NA	NA	NA
	CO4	NA	NA	NA	NA
	CO5	NA	NA	NA	NA
	CO6	NA	NA	NA	NA
	CO1	NA	NA	NA	NA
Course Outcomes	CO2	NA	NA	NA	NA
	CO3	NA	NA	NA	NA
	CO4	NA	NA	NA	NA
	CO5	NA	NA	NA	NA
	CO6	NA	NA	NA	NA
	CO1	0.82	0.82		
Course Outcomes	CO2	0.82	0.82	0.82	
	CO3	0.82	0.82	0.82	
	CO4	0.82	0.82	0.82	
	CO5	0.82	0.82	0.82	0.82
	CO6	0.82	0.82	0.82	0.82
	CO1	0.86	0.86		
Course Outcomes	CO2	0.86	0.86		
	CO3	0.86	0.86		
	CO4	0.86	0.86		
	CO5	0.86	0.86		
	CO6	0.86	0.86		
	CO1	0.91	0.91	0.91	0.91
Course Outcomes	CO2	0.91	0.91	0.91	0.91
	CO3	0.91	0.91	0.91	0.91
	CO4	0.91	0.91	0.91	0.91
	CO5	0.91	0.91	0.91	
	CO6	0.91	0.91	0.91	0.91
	CO1	0.92	0.92	0.92	0.92
Course Outcomes	CO2	0.92	0.92	0.92	0.92
	CO3	0.92	0.92	0.92	0.92
	CO4	0.92	0.92	0.92	0.92
	CO5	0.92	0.92	0.92	0.92

	CO6	0.92	0.92	0.92	0.92
	CO1	0.86	0.86		
Course Outcomes	CO2	0.86	0.86		
	CO3	0.86	0.86		
	CO4	0.86	0.86		
	CO5	0.86	0.86		
	CO6	0.86	0.86		
	CO1	0.87	0.87	0.87	0.87
Course Outcomes	CO2	0.87	0.87	0.87	0.87
	CO3	0.87	0.87	0.87	0.87
	CO4	0.87	0.87	0.87	0.87
	CO5	0.87	0.87	0.87	0.87
	CO6	0.87	0.87	0.87	0.87
	CO1	0.85	0.85		
Course Outcomes	CO2	0.85	0.85		0.85
	CO3	0.85	0.85		
	CO4	0.85	0.85		0.85
	CO5	0.85	0.85		0.85
	CO6	0.85	0.85		0.85
	CO1	0.94	0.94	0.94	0.94
Course Outcomes	CO2	0.94	0.94	0.94	0.94
	CO3	0.94	0.94	0.94	0.94
	CO4	0.94	0.94	0.94	0.94
	CO5	0.94	0.94	0.94	0.94
	CO6	0.94	0.94	0.94	0.94
	AVERAGE	0.818013937	0.822268908	0.819392265	0.81755814
	PERCENTAGE (%)	81	82	81	81

Apply the knowledge of mathematics, science,
nentals, and an engineering specialisation for the solution of complex engineering problem

ng first principles of mathematics, natural sciences, and engineering sciences.

gn system components or processes that meet the specified needs with appropriate consid
ental considerations.

ding design of experiments, analysis and
ide valid conclusions.

and modern engineering and IT tools, including prediction and modelling to complex engin

ess societal, health, safety, legal, and cultural issues and the consequent responsibilities

ns in societal and environmental contexts, and demonstrate the knowledge of, and need fo

d responsibilities and norms of the engineering practice.

der in diverse teams, and in multidisciplinary settings.

th the engineering community and with t h e society at large, such as, being able to compr
ive presentations, and give and receive clear instructions.

ing and management principles and apply these to one's own work, as a member and lead

y to engage in independent and life-long learning in the broadest context of technological c

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ory
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ɔn and
' of

ıgineering

ıg a

e of the Subject: ELECTRIC CIRCUIT THEORY
Subject Code: : PC-EE 301
Year: 2nd (New Syllabus)

of networks.

me of the Subject: ANALOG ELECTRONICS
Subject Code: PC-EE 302
Year: 2nd (New Syllabus)

regulators and analog electronic circuits.

ɛd on application.

the Subject: ELECTRO MAGNETIC FIELD THEORY
Subject Code: PC-EE 303
Year: 2nd (New Syllabus)

ıetic problems.

e of the Subject: ENGINEERING MECHANICS
Subject Code: ES-ME 301
Year: 2nd (New Syllabus)

ıematics and kinetics of rigid bodies.
ɔn and friction.

riction and rigid bodies.

Name of the Subject: MATHEMATICS-III
Subject Code: BS- M 301
Year: 2nd (New Syllabus)

Z transform

sis and Z transform

e of the Subject: BIOLOGY FOR ENGINEERS
Subject Code: BS-EE- 301
Year: 2nd (New Syllabus)

ries.

of cancer.
transfer

me of the Subject: INDIAN CONSTITUTION
Subject Code: : MC-EE 301
Year: 2nd (New Syllabus)

f Union, state and local self-government.Structure, jurisdiction and function of Indian
y.

f the Subject: : Electric circuit theory Laboratory
Subject Code: PC-EE391
Year: 2nd (New Syllabus)

on successful completion of the course, student will have:
ponse of filters, Laplace transform and inverse Laplace transform

of the Subject: : Analog Electronic laboratory
Subject Code: PC-EE392
Year: 2nd (New Syllabus)

on successful completion of the course, student will have:
fter completion of this course, the learners will be able to
r (A)characteristics of BJT and FET,(B)characteristics of Zener diode as voltage regula

ge regulator using regulator IC chip.timer circuit using 555 for monostable, astable an

hentioned outcomes are not limited. Institute may redefine outcomes based their progr

of the Subject: : Numerical Methods laboratory

Subject Code: PC-CS 391

Year: 2nd (New Syllabus)

n

ear equations using

al solution of Algebraic Equation by Regularfalsi and Newton Raphson methods.

me of the Subject: : ELECTRIC MACHINE-I

Subject Code: PC-EE-401

Year: 2nd (New Syllabus)

on successful completion of the course, student will have:

chines and transformers

ransformers

ne of the Subject: : DIGITAL ELECTRONICS

Subject Code: PC-EE-402

Year: 2nd (New Syllabus)

on successful completion of the course, student will have:

niconductor memories and programmable logic devices.

circuits, A/D and D/A converter

onal & sequential digital circuits and A/D and D/A converter.

ubject: : ELECTRICAL & ELECTRONICS MEASUREMENTS

Subject Code: PC-EE-403

Year: 2nd (New Syllabus)

on successful completion of the course, student will have:

rs in measurement, loading effect

resistance, capacitance and inductance by bridges and potentiometer

er, digital multimeter, digital voltmeter, digital frequency meter, signal generator, stra

and measurement techniques of voltage, current, frequency and phase by oscilloscope

ner, measurement of power, energy, resistance, inductance and capacitance

and transducers

f the Subject: : THERMAL POWER ENGINEERING

Subject Code: ES-EE-401

Year: 2nd (New Syllabus)

ɔines
engines and Gas turbines.
es.

he Subject: : VALUES AND ETHICS IN PROFESSION
Subject Code: HM-EE-401
Year: 2nd (New Syllabus)

ibility and duties
ethics and social experimentation
s safety and risk

e of the Subject: : ENVIRONMEMTAL SCIENCE
Subject Code: MC-EE-401
Year: 2nd (New Syllabus)

tivities
environmental and health risk
he environmental laws and regulations
nd pollution.

the Subject: : ELECTRIC MACHINE-I LABORATORY
Subject Code: PC-EE491
Year: 2nd (New Syllabus)

ol of DC motor and parallel operation of the transformer

he Subject: : DIGITAL ELECTRONICS LABORATORY
Subject Code: PC-EE492
Year: 2nd (New Syllabus)

ɔropriate instruments and precaution
and flip-flops and asynchronous and synchronous up down counters
ice versa, 4 bit parity generator & comparator circuits,

t: : ELECTRICAL & ELECTRONICS MEASUREMENT LABORATORY
Subject Code: PC-EE493
Year: 2nd (New Syllabus)

oving iron and dynamometer type ammeter, voltmeter and wattmeter by potentiomet
e, inductance, capacitance

Subject: : THERMAL POWER ENGINEEING LABORATORY
Subject Code: ES-ME-491
Year: 2nd (New Syllabus)

ecautions
ochran Boiler, Vertical Tubular Boiler, Locomotive Boiler, 4S Diesel Engine, 4S Petrol En
ctrical load box and rope brake dynamometer

he Subject: ELECTRIC MACHINE-II PC-EE-501
Subject Code: PC-EE-501
Year: 3rd

agnetic fields.
hase Induction machines
hase Induction machines
nous machine
electromechanical devices.
special eletromechanical device.

Name of the Subject: POWER SYSTEM-I
Subject Code: : PC-EE-502
Year: 3rd (Old Syllabus)

nt sources
d cables.
n line

Name of the Subject: CONTROL SYSTEM
Subject Code: PC-EE-503
Year: 3rd

ms

me of the Subject: POWER ELECTRONICS

Subject Code: PC-EE-504
Year: 3rd

ices.

n of SCR

reduction of harmonics of the converter

the Subject: ELECTRIC MACHINE-IILABORATORY
Subject Code: : PC-EE 591
Year: 3rd

hase Inductionmotor, Induction generator and synchronous motor , methods of speed

of the Subject: POWER SYSTEM-I LABORATORY
Subject Code: PC-EE 592
Year: 3rd

own strength of solidinsulating material and dielectric constant of transformer oil.

of the Subject: CONTROL SYSTEMLABORATORY

Subject Code: PC-EE 593
Year: 3rd

ICE for simulation of systems.
ns.

the Subject: POWER ELECTRONICSLABORATORY
Subject Code: PC-EE 594
Year: 3rd

of the Subject: DATA STRUCTURE & ALGORITHM

Subject Code: OE-EE-501A
Year: 3rd

nce the performanceof the program.
s.

lem.
g, searching, and hashing
ns.
the Subject: OBJECT ORIENTED PROGRAMMING
Subject Code: OE-EE-501B

norphism,

Name of the Subject: POWER SYSTEM-II
Subject Code: PC-EE-601
Year: 3rd

studies.

ments.
bilty and protection ofpower system.
e Subject: MICROPROCESSOR & MICROCONTROLLER
Subject Code: PC-EE-602

e of the Subject: DIGITAL CONTROL SYSTEM
Subject Code: PE-EE-601A
Year: 3rd

tems.

cations.

ıme of the Subject: HVDC TRANSMISSION
Subject Code: PE-EE-601B
Year: 3rd

fter completion of this course the students will be able to
pplication(s).
ıverters.

des.
eactive power control.nts.

of the Subject: ELECTRICAL MACHINE DESIGN
Subject Code: PE-EE-601C
Year: 3rd

ign of an ac machine
magnetic and thermalloading of electrical machines
nachines.

the Subject: ELECTRICAL AND HYBRID VEHICLE
Subject Code: PE-EE-602A
Year: 3rd

lepending on resources.
vehicles.

e of the Subject: POWER QUALITYANDFACTS
Subject Code: PE-EE-602B
Year: 3rd

ıcteristics.

explain working principle of dynamic voltage restorer and UPQC

ıstrial consumers.
:trical systems.

ectrical systems.

power factor correction.

in the frequencydomain.

o SNR
eivers
ommunication system
nication link

gital modulation systems

ıtion

eduling, legal andregulatory issues applied to economic investment and project-mana

.
earth fault relay, on loadtime delay relay, off load time delay relay, CT and PT.
der. 6. Apply software tools to find bus voltage, currents and power flows throughout t

a number in a string andstring manipulation

ns of 8051

sor and signal conditioning circuits

;
n system for small township, double circuit transmission line and Electric machines
with lift and pump
and for an applicationwith analog, digital, mixed signal, microcontroller and PCB

rmance.

te space.

ation and pollution.
tems
stems
ergy intensive industrialequipments

ition.

›mes minimum for a definedlevel of load.
d phase angles at all buses.
mand at all the times.

nd transform the real lifeinformation in different representation

nine learning

and limitations, and societalimplications

erent contexts

he key technologies andprotocols employed at each layer of the stack
ata analysis

lgorithm, areafilling algorithms.

acteristics and attributesof Embedded Systems

bedded systems.

ms. 6. design RTOS based Embedded systems.

. 2. enhance images in the spatial and frequency domain using various transforms.

rces in the organizationsand integrate the learning in handling these complexities.
gement.

s. 2. explain the fundamental of Electrolytic processes, Electric heating and Welding.
specific applications.

of traction motor.

erent components and stability.

on and Synchronous motor.
1 and SRM.

onous motor.

ontrol valves.

machines
particular problem
oft computing approach
roblem.
ns.

e and respiration rate.
ging equipments Surgical & Therapeutic Instruments and Medical Laboratory Instrume

nent methods.

techniques.

s and procedures for measurement of physical parameters

. 6. apply smart sensors, bio-sensors, PLC and Internet of Things to different applicati

PO5	PO6	PO7	PO8	PO9	PO10
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	0.76				

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				0.83	0.83
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d multistable, multivibrator. V to I and I 89

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86	81

Department of Electronics & Communication Engineering
CO ATTAINMENT
2021-2022

Paper Code (Name)	COs	COURSE OUTCOMES(COs)	Attainment (%)
3RD SEMESTER			
EC301 (Electronic Devices)	**CO1**	Differentiate the conduction techniques in semiconductor materials	75%
	CO2	Analyze characteristics of semiconductor diodes, bipolar transistors, Mos-Transistors and solve problems.	75%
	CO3	Differentiate between different Opto-electronic devices	75%
EC302 (Digital System Design)	**CO1**	Convert various number system and apply logic gates, Boolean algebra and K-Map to design digital circuits.	75%
	CO2	Design the digital combinational circuits likes decoders, encoders, multiplexers and de-multiplexers, half adder, full adder and compare their performance to optimize production cost and also develop sequential digital circuits like flip-flop, register, counter to design memory device.	75%
	CO3	Illustrate the knowledge of ROM,RAM,PROM,PLD,FPGA,TTL,CMOS and ECL apply them to design VLSI system.	75%
EC303 (Signals & Systems)	**CO1**	Analyze different types of signals.	45%
	CO2	Represent continuous and discrete systems in time and frequency domain using different transforms.	45%
	CO3	Investigate whether the system is stable.	45%
	CO4	Sampling and reconstruction of a signal.	45%
EC304 Network Theory	**CO1**	**Apply** all the electrical network theories and the concept of resonance to typical electric circuits with AC & DC sources to solve problems related to electronics & Communication Engineering	67%
	CO2	**Apply** Laplace transform technique to **analyze** complex electrical circuits in s domain and solve for voltage & current values related to electronics & communication Engineering.	67%
	CO3	**Apply** the knowledge of any set of two-port parameters for circuit analysis, & measurement of different parameters and convert one set of two-port parameters to another.	67%
ES-CS301 Data Structure & Algorithm (ES)	**CO1**	Implementation of different data structures efficiently.	75%
	CO2	Usage of well-organized data structures to handle large amount of data.	75%
	CO3	Usage of appropriate data structures for problem solving.	75%

BS-M301 Probability & Statistics(BS)	**CO1**	The students will learn: The ideas of probability and random variables and various discrete and continuous probability distributions and their properties.	78%
	CO2	The basic ideas of statistics including measures of central tendency, correlation and	78%
	CO3	The statistical methods of studying data samples.	78%
EC391 Electronic Devices Lab.)	**CO1**	Organize/Design the experiment related to **Solid State Device Lab.**	81%
	CO2	Generate experimental Data related to **Solid State Device Lab.**	81%
	CO3	Conduct actual experiment related to **Solid State Device Lab.**	81%
	CO4	Analyze data and draw conclusion related to **Solid State Device Lab.**	81%
	CO5	Analyze with proper experimental data and graphs and communicate effectively related to **Solid State Device Lab.**	81%
EC392 Digital System Design	**CO1**	Organize/Design the experiment related to **Digital System Design Lab.**	88%
	CO2	Generate experimental Data related to **Digital System Design Lab.**	88%
	CO3	Conduct actual experiment related to **Digital System Design Lab.**	88%
	CO4	Analyze data and draw conclusion related to **Digital System Design Lab.**	88%
	CO5	Analyze with proper experimental data and graphs and communicate effectively related to **Digital System Design Lab.**	88%
ESCS391 Data Structure Lab	**CO1**	Design and develop programs using data structure & algorithm concepts.	81%
	CO2	Develop simple applications using linear and non-linear data structures & algorithms concepts and understand the access mechanisms and other use and functionalities.	81%
	CO3	Implement searching and sorting concepts for problem solving.	81%
	CO4	Implement the concepts of graph and hashing concepts for problem solving.	81%
4TH SEMESTER			
EC401 Analog Communication	**CO1**	Design system components for amplitude modulation techniques that meet the specified needs with appropriate consideration relevant to complex analog communication systems	78%
	CO2	Analyze system components and calculate the corresponding values for nonlinear communication systems that meet the specified needs with appropriate consideration relevant to complex analog communication systems.	78%
	CO3	Analyze a stereo and a multiplexed system as applied to audio, analog or	78%

		digital communication respectively.	
	CO4	Analyze noise parameters and compare signal to noise ratio for analog modulation techniques reaching substantiated conclusions on the performance of analog communication systems.	78%
EC402 Analog Electronic Circuits	**CO1**	Understand the characteristics of diodes and transistors and design and analyse various rectifier and amplifier circuit.	75%
	CO2	Understand the functioning of OP-AMP and design OP-AMP based circuits, Oscillators and multivibrators.	75%
EC403 Microprocessor & Microcontrollers	**CO1**	Students will be able to do assembly language programming using 8085/8086 and interfacing design of peripherals like I/O, A/D, D/A, Timer etc.	78%
	CO2	Students will be able to distinguish and analyze the properties of microcontroller	78%
ESCS401 Design and Analysis of Algorithm	**CO1**	To analyze and identify the Complexity of a problem and compute the recurrence relation.	75%
	CO2	To analyze the several algorithms design techniques on some certain problems using divide & conquer method, dynamic programming approach, backtracking, greedy method.	75%
	CO3	To understand lower bound theory, graph traversal algorithm, network flow, disjoint set manipulation different method.	75%
	CO4	To design the algorithm of string matching problem, matrix manipulation algorithm.	75%
	CO5	To understand amortize analysis, approximation algorithm, notion of NP-completeness.	75%
BS M401 Numerical Methods	**CO1**	To develop thorough understanding of the mathematical concepts and theories that underlie numerical methods. This includes topics such as interpolation, differentiation, integration, and linear algebra.	74%
	CO2	Students should be able to analyse a given engineering problem and choose the appropriate numerical method to solve it. This requires an understanding of the strengths and limitations of various numerical techniques.	74%
	CO3	Students should be able to write computer programs to implement numerical algorithms. This includes an understanding of programming languages such as MATLAB, Python, or C++.	74%
	CO4	Students should understand the concept of numerical error and the sources of error in numerical calculations. They should be able to perform error analysis and make appropriate adjustments to improve the accuracy of their numerical solutions.	75%
BS B401 Biology for	**CO1**	After studying the course, the student will be able to: Describe how biological observations of 18th Century that lead to major	81%

Engineer		discoveries and Convey that classification per se is not what biology is all about but highlight the underlying criteria, such as morphological, biochemical and ecological	
	CO2	Highlight the concepts of recessiveness and dominance during the passage of genetic material from parent to offspring Convey that all forms of life have the same building blocks and yet the manifestations are as diverse as one can imagine	81%
	CO3	Classify enzymes and distinguish between different mechanisms of enzyme action. Identify DNA as a genetic material in the molecular basis of information transfer.	81%
	CO4	Analyse biological processes at the reductionistic level Apply thermodynamic principles to biological systems.	81%
	CO5	Identify and classify microorganisms.	81%
EC491 Analog Communication Lab	**CO1**	Organize/Design the experiment related to **Analog Communication Lab.**	81.25%
	CO2	Generate experimental Data related to **Analog Communication Lab.**	81.30%
	CO3	Conduct actual experiment related to **Analog Communication Lab.**	82.22%
	CO4	Analyze data and draw conclusion related to **Analog Communication Lab.**	81.48%
	CO5	Analyze with proper experimental data and graphs and communicate effectively related to **Analog Communication Lab.**	81.85%
EC492 Analog Electronic Circuit	**CO1**	Organize/Design the experiment related to **Analog Electronic Circuit Lab.**	83.14%
	CO2	Generate experimental Data related to **Analog Electronic Circuit Lab.**	83.14%
	CO3	Conduct actual experiment related to **Analog Electronic Circuit Lab.**	83.14%
	CO4	Analyze data and draw conclusion related to **Analog Electronic Circuit Lab.**	83.14%
	CO5	Analyze with proper experimental data and graphs and communicate effectively related to **Analog Electronic Circuit Lab.**	83.14%
EC493 Microprocessor & Microcontroller Lab	**CO1**	The knowledge of basic microcomputer system and the architecture as well as assembly language programming of 8085 **Microprocessor** to solve engineering problems related to design system based on these processors in ECE.	93.8%
	CO2	The knowledge of architecture and assembly language programming of 8051 microcontroller and the architecture of PIC to solve engineering problems related to design system based on these processors in ECE	93.7%
	CO3	The knowledge of architecture and assembly language programming of 8086 **Microprocessor** to solve engineering problems related to design system based on these processors in ECE.	93.5%
	CO4	The knowledge of memory and peripheral interfacing devices to solve engineering problems related to design of I/O and memory interfacing of **Microprocessor and Microcontroller Lab** based system in ECE.	93.7%

	CO5	Analyze with proper experimental data communicate effectively related to **Microprocessor and Microcontroller Lab.**	93.8%
BS-M(CS)491 Numerical Method Lab.	**CO1**	Students would develop deep understanding of numerical algorithms, including interpolation, differentiation, integration, and linear algebra, and how these algorithms can be implemented in C.	61%
	CO2	Students would be able to write computer programs in C to implement numerical algorithms. This requires an understanding of the syntax and features of C programming language.	61%
	CO3	Students would develop an understanding of programming concepts such as data structures, control structures, functions, and file handling in C, and how these concepts can be used to implement numerical algorithms.	61%
	CO4	Students would be able to identify and fix errors in C programs, including runtime errors, syntax errors, and logical errors. They should also understand the importance of error handling in numerical computations.	61%
5TH SEMESTER			
EC501 Electromagnetic Waves	**CO1**	Understand the basic mathematical concepts related to electromagnetic vector fields.	70%
	CO2	Characterize uniform plane wave and calculate reflection and transmission of waves at media interface.	70%
	CO3	Understand characteristics and wave propagation on high frequency transmission lines, carryout impedance transformation on transmission line and use sections of transmission line sections for realizing circuit elements.	70%
	CO4	Analyze wave propagation on metallic waveguides in modal form.	70%
	CO5	Understand principle of radiation and radiation characteristics of an antenna.	70%
EC502 Computer Architecture	**CO1**	learn how computers work and know basic principles of computer's Working procedure.	70
	CO2	Analyze the performance of computers.	70
	CO3	Know how computers are designed and built.	70
	CO4	Understand issues affecting modern processors (caches, pipelines etc.)	70
EC503 Digital Communication & Stochastic Process	**CO1**	Apply the fundamental knowledge of probability theory and random processes for the solution of complex engineering problems related to digital communication techniques.	64
	CO2	Analyze signal and system parameters using the methods of vector algebra reaching substantiated conclusions on digital communication techniques.	64
	CO3	Design solution for baseband transmission techniques as applicable to digital communication	64

	CO4	Design solution for digital carrier modulation techniques as applicable to electronics and Communication Engineering	64
EC504 **Digital Signal Processing**	**CO1**	Appling sampling theorem students can able to **construct/convert** continuous time signal/analog into digital sequence and gain the **knowledge** from time to frequency domain conversion like DTFT,DFT.	68%
	CO2	Student can able to **design** and **implement** different types of digital filters(both FIR and IIR) from analog prototype filter using the knowledge of filter transformation(Likely Impulse invariant and Bilinear transform) in different form such as direct form-I, form-II, cascade and parallel etc.	68%
	CO3	They can able to **process** digital signals and can also **design** Digital system/Digital signal Processor by setting proper Algorithm onto FPGA and writing Assembly level program.	68%
PEEC505A Program Elective1 Nano Electronics	**CO1**	Understand various aspects of nano-technology and the processes involved in making nano components and material and appropriate use in solving practical problems	68%
	CO2	Appropriate use of different nano-technology for life-long learning.	68%
EC591 Electromagnetic Wave Lab	**CO1**	Understand the radiation pattern of dipole antenna	83%
	CO2	Understand the radiation pattern of Folded dipole antenna.	83%
	CO3	Understand the radiation pattern of 3 element yagi -uda antenna .	83%
	CO4	Analyze the beam width, gain and radiation pattern of a 3-element,5 element and 7 element yagi- uda antenna.	83%
	CO5	Evaluate the radiation characteristics of a Pyramidal horn antenna	83%
EC592 Digital Communication Lab	**CO1**	Apply the fundamental knowledge of probability theory and random processes for the solution of complex engineering problems related to digital communication techniques.	93%
	CO2	Analyze signal and system parameters using the methods of vector algebra reaching substantiated conclusions on digital communication techniques.	93%
	CO3	Design solution for baseband transmission techniques as applicable to digital communication	93%
	CO4	Design solution for digital carrier modulation techniques as applicable to electronics and Communication Engineering	93%
EC593 Digital Signal Processing Lab.	**CO1**	**Organize/Design** the experiment related to **Digital Signal Processing Lab.**	94.8
	CO2	**Generate** experimental Data related to **Digital Signal Processing Lab.**	94.8
	CO3	**Conduct** actual experiment related to **Digital Signal Processing Lab.**	94.6
	CO4	**Analyze** data and draw conclusion related to **Digital Signal Processing Lab.**	94.9
	CO5	**Analyze** with proper experimental data and graphs and communicate effectively related to **Digital Signal Processing Lab.**	94.8

6TH SEMESTER			
EC601 Control System & Instrumentation	**CO1**	**Characterize** a system and find its steady state behavior.	64%
	CO2	**Investigate** stability of a system using different test related to control system.	64%
EC602 Computer Network	**CO1**	Familarization with the fundamental knowledge of data communication and networks and **apply** this knowledge to **investigate** the error in the communication network and **analyze** the errors using different error correcting codes.	64%
	CO2	**Analyze** the internetworking devices and **investigate** different addressing and subnetting protocols to **investigate** proper process to process delivery.	64%
PEEC603D Information Theory & Coding	**CO1**	Recognize the notion of information in the quantitative sense to measure the quantity of information for transmission of data and apply this basic knowledge to calculate channel capacity and probability distribution for real time transmission systems.	65%
	CO2	Assess the fundamental coding theorem for encoding and decoding the information and develop the different techniques for construction of error correction codes .	65%
	CO3	Evaluate the rate and error probabilities in different coding techniques to implement the cost effective system.	65%
OEEC604C Object Oriented Programming	**CO1**	differentiate between structures oriented programming and object oriented programming.	70%
	CO2	use object oriented programming language like C++ and associated libraries to develop object orientedprograms.	70%
	CO3	understand and apply various object oriented features like inheritance, data abstraction, encapsulation andpolymorphism to solve various computing problems using C++ language.	70%
	CO4	apply concepts of operator-overloading, constructors and destructors	70%
	CO5	apply exception handling and use built-in classes from STL.	70%
EC691 Control System & Instrumentation Lab.	**CO1**	**Characterize** a system and investigate stability of the system in time and frequency domain with different method related to **Control and Instrumentation Lab.**	90%
	CO2	**Design** various controllers related to **Control and Instrumentation Lab.**	90%
	CO3	**Conduct** experimental set up with CRO ,Instrumentation Amplifier knowing their functional details related to **Control and Instrumentation Lab.**	90%
	CO4	**Conduct** actual experiment related to **Control System and Instrumentation Lab.**	90%
	CO5	**Analyze** with proper experimental data and graphs and communicate effectively related to **Control System and Instrumentation Lab.**	90%
EC692 Computer Network	**CO1**	Understand the basic concept related to NIC installation and configuration. Apply the knowledge of IPC message queue.	95%
	CO2	Remembering and understanding the networking cables, switches, hubs and	95%

Lab		connectors.	
	CO3	Understand multicast and broadcast socket and analyze TCP/UDP socket programming.	95%
	CO4	Applying the knowledge of socket programming, analyze prototype multithreaded server.	95%
	CO5	Understand the knowledge of data link layer flow control mechanism and apply this knowledge for the error control.	95%
EC681 Electronic Design Mini Project Lab	**CO1**	Formulation of a problem statement either from rigorous literature survey or from the requirements raised need to be analysed.	90%
	CO2	Design, implement and test the photo type/algorithm in order to solve the problem statement.	90%
	CO3	Write comprehensive report on Mini Project work.	90%
7TH SEMESTER			
EC701B Satellite Communication	**CO1**	Visualize the architecture of satellite systems as a means of high speed, high range communication system.	73%
	CO2	State various aspects related to satellite systems such as orbital equations, sub-systems in a satellite, link budget, modulation and multiple access schemes.	73%
	CO3	Solve numerical problems related to orbital motion and design of link budget for the given parameters and conditions.	73%
EC702C Neural Network and Fuzzy Logic Control	**CO1**	Analyze and classify neural networks and its implementation algorithms.	71%
	CO2	Apply suitable algorithms on different cases.	71%
	CO3	Apply fuzzy logic and neural networks.	71%
	CO4	Analyze the applications of Neural Network and Fuzzy logic in image processing.	71%
EC703A Embeded System	**CO1**	Understand the internal structure, purpose and application of Embedded system.	74%
	CO2	Apply the concept of Embedded firmware in design of Embedded System.	74%
OEEC704A Web Technology	**CO1**	design good web pages using different tags, tables, forms, frames and style sheets supported by HTML and implement, compile, test and run Java programs, comprising more than one class, to address a particular software problem.	73%
	CO2	demonstrate the ability to employ various types of selection statements and iteration statements in a Java program.	73%
	CO3	be able to leverage the object-oriented features of Java language using abstract class and interface.	73%
	CO4	be able to handle errors in the program using exception handling techniques of Java.	73%
	CO5	design applets as per the requirements with event handling facility.	73%
EC781 Industrial Training & Project	**CO1**	Apply knowledge(fundamental & specialized) to understand the real life problem in the related field.	**90**
	CO2	Understand the design and implementation aspects of engineering	**73**

OEEC704A		system/components.	
	CO3	Work individually and also in a group.	**73**
	CO4	Communicate the details of training through Training Report, Presentation and Viva-Voce.	**73**
	CO5	Understand implication of engineering solutions in social and environmental perspective.	**73**
EC782 Project Stage 1	**CO1**	Formulate the problem.	**92**
	CO2	Develop or design a solution of the problem.	**92**
	CO3	Build up project prototype or model in hardware or software.	**92**
	CO4	Analyze the experimental/collected data.	**92**
	CO5	Do investigation/research in the problem area.	**92**
	CO6	Apply fundamental and specialize knowledge in the area of the problem.	**92**
	CO7	Self learn new methods, tools and techniques.	**92**
	CO8	Apply modern tools and techniques.	**92**
	CO9	Work individually and also in team.	**92**
	CO10	Communicate the details and findings of the project through project report, presentation, Viva-Voce and paper presentation , if any.	**92**
	CO11	Apply project management and economic knowledge	**92**
	CO12	Identify implications of the project in society and environment.	**92**
8TH SEMESTER			
PEEC 801B Fibre Optics Communication	**CO1**	**Learn** the properties of light in different medium and **utilize** the knowledge in different types of fibres for optical fibre communication system, and also the corresponding losses of each kinds of fibres.	**83**
	CO2	**Learn** the working of all types of optical source and detectors for signal modulation and demodulation respectively.	**83**
PEEC802C	**CO1**	Understand the practical situations where mixed signal analysis is required.	**74**
	CO2	Analyze and handle the inter-conversions between signals.	**74**
	CO3	Design systems involving mixed signals.	**74**
OEEC804C	**CO1**	Understand the modern view of AI as the study of agents that receive precepts' from the environment and perform actions.	**75**
	CO2	Demonstrate awareness of the major challenges facing AI and the complex of typical problems within the field.	**75**

	CO3	Exhibit strong familiarity with a number of important AI techniques, including in particular search, knowledge representation, planning and constraint management.	**75**
	CO4	Asses critically the techniques presented and to apply them to real world problems.	**75**
EC881 Project II	**CO1**	Formulate the problem.	**95**
	CO2	Develop or design a solution of the problem.	**95**
	CO3	Build up project prototype or model in hardware or software.	**95**
	CO4	Analyze the experimental/collected data.	**95**
	CO5	Do investigation/research in the problem area.	**95**
	CO6	Apply fundamental and specialize knowledge in the area of the problem.	**95**
	CO7	Self learn new methods, tools and techniques.	**95**
	CO8	Apply modern tools and techniques.	**95**
	CO9	Work individually and also in team.	**95**
	CO10	Communicate the details and findings of the project through project report, presentation, Viva-Voce and paper presentation , if any.	**95**
	CO11	Apply project management and economic knowledge	**95**
	CO12	Identify implications of the project in society and environment.	**95**
EC882 Grand Viva	**CO1**	Demonstrate the capability to formulate the problem.	**95**
	CO2	Demonstrate the capability to develop or design a solution of the problem.	**95**
	CO3	Demonstrate the capability to build up project prototype or model in hardware or software.	**95**
	CO4	Demonstrate the capability to analyze the experimental/collected data.	**95**
	CO5	Show the capability to demonstrate the research based knowledge	**95**
	CO6	Demonstrate the capability to apply fundamental and specialize knowledge in the area of the problem.	**95**
	CO7	Demonstrate the capability for self learning new methods, tools and techniques.	**95**
	CO8	Demonstrate the capability to apply modern tools and techniques.	**95**
	CO9	Demonstrate the capability to work individually and also in team.	**95**
	CO10	Demonstrate the capability to communicate in details and present a topic related to Electronics & Communication Engineering.	**95**

CALCUTTA INSTITUTE OF ENGINEERING AND MANAGEMENT
DEPARTMENT OF INFORMATION TECHNOLOGY
CO ATTAINMENT REPORT
2021-2022

FIRST SEMESTER			
PAPER CODE (Name)	**CO No.**	**Course Outcomes**	**Attained ()**
BS PH-101 (Physics-1)	**CO1**	Apply the knowledge of simple harmonic motion (ideal and real cases) and basic concepts of Mechanics for the solution of complex problems.	81
	CO2	Utilize the knowledge of vector calculus and different coordinate system for the solution of complex problems.	72
	CO3	Apply the knowledge of physical optics (interference, diffraction, polarization) and LASER to solve different complex problems	75
	CO4	Apply the knowledge of dielectric and magnetic properties of materials to interpret different complex systems.	83
	CO5	Utilize the knowledge of Quantum Physics to analyze a complex engineering problem.	69
	CO6	Apply the knowledge statistical mechanics to solve complex problems.	79
BS-M(101) (Mathematics I(A))	**CO1**	To understand the concept and techniques of differential and integral calculus.	75
	CO2	To understand the domain of application of MVT,to engineers problem.	90
	CO3	To learn the concept of eigen values , eigen vectors,diagonalisation	72
ES-EE101 (Basic Electrical Engineering)	CO 1	To understand and analyze basic electric and magnetic circuits.	70
	CO 2	To study the working principles of electrical machines and power converters.	75
	CO 3	To introduce the components of low voltage electrical installations.	70
BS PH-191 (Physics-I Laboratory)	CO1	Organize/design the experiment related to various systems and interpret the physical properties of material.	72
	CO2	Generate experimental Data related to electrical and magnetic properties.	80

	CO3	Conduct actual experiment related to optical phenomena.	78
	CO4	Analyze data and draw conclusion related to quantum physics.	85
	CO5	Analyze with proper experimental data and graphs and communicate effectively.	75
ES-EE 191 (Basic Electrical Engineering Laboratory)	**C0 1**	Gather knowledge about the safety precautions and the do's-don'ts while dealing with electrical equipments.	75
	CO 2	Study about the different electrical instruments and devices through their input-output relationship.	65
	CO 3	Organize different electrical instruments like ammeter, voltmeter, wattmeter and different electrical devices like transformer, rheostat, etc. to observe the output through incandescent lamps.	70
ES ME 192 (Workshop /Manufacturing Practices)	CO1	Utilize the concept of fitting shop and make typical jobs.	70
	CO2	Learn the basics of carpentry shop and utilize the concept to make typical jobs.	70
	CO3	Develop the concept of various machining processes and make use of Lathe, Shaping and Milling machine to construct typical jobs.	65
	CO4	Develop the concept of metal joining process and utilize the concept of welding to join to metal plates.	70

THIRD SEMESTER			
PAPER CODE (Name)	**CO No.**	**Course Outcomes**	**Attained(%)**
ESC301 (Analog & Digital Electronics)	**CO1**	Convert various number system and apply logic gates, Boolean algebra and K-Map to design digital circuits.	60
	CO2	Design the digital combinational circuits likes decoders,encoders,multiplexers amd de-multiplexers, half adder, full adder and compare their performance to optimize production cost and also develop sequential digital circuits like flip-flop, register, counter to design memory device.	62
	CO3	Design and analyse various amplifier circuit, multivibrators, ROM, RAM, FPGA,TTL,CMOS and ECL	55

PCC-CS301 (Data Structure & Algorithm)	CO1	Differentiate how the choices of data structure & algorithm methods impact the performance of program	79
	CO2	Solve problems based upon different data structure & also write programs	83
	CO3	Identify appropriate data structure & algorithmic methods in solving problem	80
	CO4	Discuss the computational efficiency of the principal algorithms for sorting, searching, and hashing.	82
	CO5	Compare and contrast the benefits of dynamic and static data structures implementations	71
PCC CS-302 (Computer Organization)	CO1	Analyze the relevance of classical and modern problems of computer design and construct machine code instructions.	70
	CO2	Design logical expressions and corresponding integrated logic circuits for a variety of problems including the basic components of a CPU such as adders, multiplexers, ALU using fixed-point and floating-point addition, subtraction, multiplication & division algorithm.	75
	CO3	Analyze hierarchical memory system including cache memories and virtual memory and Calculate their Cost, Speed and Capacity.	70
	CO4	Apply the knowledge of various micro-programmed instructions using the concept of pipelining for designing Control Unit and accessing I/O operation.	65
BSC-301 (Mathematics – III(Differential Calculus))	CO1	Express a logic sentence in terms of predicates,quantifiers,and logical connectives	70
	CO2	Apply the rules of interference and proof by contradiction,mathematical induction.	72
	CO3	Use tree and graph algorithm to solve the problems.	75
	CO4	Apply Boolean function ,and simplify expression	70
	CO5	To apply Boolean algebra to solve engineering problems	74
HSMC 301 (Economics for Engineers(Humanities -II))	CO1	Student will able to analyze the economic decisions making, engineering costs & estimation and classification of costs by applying the knowledge of estimating models. Student will develop an understanding of cash flow, rate of return analysis in different socio-environmental situations.	58

	CO2	Analysis of inflation and price change will be done to the students for their proper understanding of the price indexes in economic analysis. Effect of inflation & deflation is analyzed to them to remember and if required to apply in real-life scenarios.	59
	CO3	Illustration of types of property, depreciation and expenses and its impact on business, for better understanding of the business environment and apply the knowledge of it.	61
ESC391 (Analog & Digital Electronics)	CO1	Organize/design the experiment related to analog electronic circuit lab.	70
	CO2	Design the digital combinational circuits likes decoders,encoders,multiplexers amd de-multiplexers, half adder, full adder and compare their performance to optimize production cost.	65
	CO3	Develop sequential digital circuits like Flip-Flop, Registers, Counters to design memory devices.	70
PCC-CS391 (Data Structure & Algorithms)	CO1	Apply the knowledge of linear data structure to implement Linked list, Stack, Queue, Array.	85
	CO2	Apply the knowledge of nonlinear data structure to implement different types of tree.	80
	CO3	Implement different types of searching and sorting techniques in data structure.	82
PCC CS-392 (Computer Organisation)	CO1	Analyze the behaviour of logic gates	80
	CO2	Design combinational circuits for basic components of computer system and applications.	80
	CO3	Design arithmetic circuit for computer system.	80
	CO4	Design Arithmetic logic units and different types of memory blocks.	80
PCC-CS393 (IT Workshop (Sci Lab/ MATLAB/ Python/ R))	CO1	To master an understanding of scripting & the contributions of scripting languages	83
	CO2	Design real life problems and think creatively about solutions	85
	CO3	Apply a solution in a program using Python.	82
	CO4	To be exposed to advanced applications of mathematics, engineering and natural sciences to program real life problems.	74

FIFTH SEMESTER 2022			
ESC-501 (Software Engineering)	CO1	Understand basic SW engineering methods and practices, and their appropriate application.	85
	CO2	Understand u of software process models such as the waterfall and evolutionary models.	80
	CO3	Students will be able perform various life cycle activities like Analysis, Design, Implementation, Testing and Maintenance.	90
	CO4	Students will be able to know various processes used in all the phases of the product.	70
	CO5	Students can apply the knowledge, techniques, and skills in the development of a software product.	65
PCC-CS501 (Compiler Design)	CO1	Understand given grammar specification develop the lexical analyser	90
	CO2	Design a given parser specification design top-down and bottom-up parsers	85
	CO3	Develop syntax directed translation schemes	80
	CO4	Develop algorithms to generate code for a target machine	75
PCC-CS502 (Operating Systems)	CO1	Analyse processes and threads.	60
	CO2	Develop algorithms for process scheduling for a given specification of CPU utilization, Throughput, Turnaround Time, Waiting Time, Response time.	70
	CO3	Formulate a given specification of memory organization develop the techniques for optimally allocating memory to processes by increasing memory utilization and for improving the access time. Design and implement file management system.	65
	CO4	Categorize a given I/O devices and OS (specify) develop the I/O management functions in OS as part of a uniform device abstraction by performing operations for synchronization between CPU and I/O controllers.	60
PCC-CS503 (Object Oriented Programming)	CO1	Understand Abstract Data Types and their implementations using abstraction functions to document them.	70

	CO2	Apply the features of object-oriented design to implement encapsulation, polymorphism, inheritance, and composition of systems based on object identity.	80
	CO3	Name and apply some common object-oriented design patterns and give examples of their use.	65
	CO4	Design applications with an event-driven graphical user interface.	80
HSMC 501 (Introduction to Industrial Management (Humanities – III))	CO1	Student will able to analyze the organisation structure , organizational culture and climate by applying the knowledge of factors affecting them.	59
	CO2	Analysis of determination of critical path on network will be done to the students for their proper understanding of determination of floats, material management, storekeeping- functions.	61
	CO3	Illustration of production planning and control, value analysis and its impact on business, for better understanding of the recent trends in IM and apply the knowledge of it.	62
PEC-IT501B (Artificial Intelligence)	CO1	Apply the good programming skills to formulate the solutions for computational problems.	60
	CO2	Design and develop solutions for informed and uninformed search problems in AI.	70
	CO3	Demonstrate and enrich knowledge to select and apply AI tools to synthesize information and develop models within constraints of application area.	75
	CO4	Develop a minor project in multidisciplinary areas to demonstrate team work through reports and presentation.	70
	CO5	To design and develop an Expert System that operates in a realistic problem domain and communicate effectively in a team or individual and prepare reports.	60
PEC-IT501C (Advanced Computer Architecture)	CO1	Demonstrate concepts of parallelism in hardware/software.	70
	CO2	Discuss memory organization and mapping techniques.	85
	CO3	Describe architectural features of advanced processors.	75

	CO4	Interpret performance of different pipelined processors.	70
	CO5	Development of software to solve computationally intensive problems	65
MC-CS501 (Constitution of India)	CO1	To be able to identify the fundamental rights and duties, Directive Principles of State Policy in the Constitution of India by assessing the functions of various governmental administrations (Centre & State) and the Election Commission	72
ESC-591 (Software Engineering)	CO1	To understand the software engineering methodologies involved in the phases for project development.	85
	CO2	To gain knowledge about open-source tools used for implementing software engineering methods.	90
	CO3	To exercise developing product-startups implementing software engineering methods.	60
	CO4	Learn simple optimization techniques.	75
PCC-CS592 (Operating Systems)	CO1	Design and solve complex UNIX programs.	60
	CO2	Apply the knowledge of process and threads.	70
	CO3	Design and formulate inter process communication through programming.	65
PCC-CS593 (Object Oriented Programming)	CO1	Implement features of object-oriented design such as encapsulation, polymorphism, inheritance, abstraction.	93
	CO2	Implementing multithreading concept in object oriented programming.	92
	CO3	Design applications with an event-driven graphical user interface.	95

SEVENTH SEMESTER 2022			
PEC-IT701C (Cloud Computing)	CO1	Explain the core concepts of the cloud computing paradigm, Cloud classification, Characteristics of Cloud Computing, different cloud models	85
	CO2	Discuss concepts of Abstraction and Virtualization technologies, Load Balancing, Hypervisors, compare different service models	75

	CO3	Lifecycle management of cloud services, Concepts of Cloud Security	65
	CO4	Discuss basic concept of Service Oriented Architecture, Applications in the Cloud, Cloud-based Storage	70
PEC-IT702A (Multimedia Technology)	CO1	Apply the knowledge of the diverse functions of Multimedia systems and its related hardware and software for the solution of problem related to Information Technology.	77
	CO2	Apply the knowledge of text, audio, image and video file formats for enhancement of the text, audio, image and video with using text, audio, image and video processing tools for the solution of a complex problem related to text, audio, image and video in the field of Information Technology.	76.
	CO3	Able to use various types of multimedia data storage devices for storage & retrieval of multimedia data.	73
	CO4	Design different types of multimedia applications like video-on-demand, video conferencing, digital libraries and other industrial applications.	72
OEC-IT701C (Soft Skill & Interpersonal Communication)	CO1	Students will be able to define the significance of soft skills by recalling relevant terminology and concepts from the syllabus, as assessed by a multiple-choice examination.	83
	CO2	Students will be able to evaluate their own beliefs, values, and attitudes in order to set goals and engage in self-discovery activities, as demonstrated by a written reflection essay.	81
	CO3	Students will be able to apply strategies for developing positive thinking, driving out negativity, and enhancing motivation levels in order to achieve personal and professional goals, as demonstrated through a group project and presentation.	74
	CO4	Students will be able to create and communicate effective messages and interpersonal relationships in a corporate context, as demonstrated by a formal report and presentation on a business scenario.	68

HSMC 701 (Project Management and Entrepreneurship)	CO1	Student will able to analyze the concept of innovation and entrepreneurship, contributions of entrepreneurs to the society, risk-opportunities perspective by applying the knowledge of factors affecting them.	58
	CO2	Analysis of project management, issues and problems in project management, project life cycle - initiation / conceptualization phase, determination of project feasibility studies will be done to the students for their proper understanding of social cost benefit analysis.	59
	CO3	Identification and illustration of the critical path and its significance, types of floats and slacks and its impact on business, for better understanding of the recent trends and apply the knowledge of it.	60
PROJ-IT 781 (Project - II)	CO1	To survey the literature; Identify and classify the requirements for the solution of complex engineering problems.	77
	CO2	To define the requirements of the project by proper analysis and interpretation of data and processes supported by standard documentation.	78
	CO3	To analyze the processes by mapping requirements in to Use case diagram(s)/ Data Flow Diagram(s)/ Algorithm(s)/ User-Interface design/ Entity Relationship Diagram(s) etc.	80
	CO4	To design behaviour of the application with modular programming and program flowchart/ class diagrams and sequence diagrams, etc.,following standard guidelines.	81
	CO5	To estimate project metrics like size, effort and cost , reliability and quality, etc and plan project development schedule using PART and GNATT charts.	82
	CO6	To justify the project work with technical documentation, presentation, and discussions as a group to share knowledge.	82

SECOND SEMESTER			
PAPER CODE (Name)	**CO No.**	**Course Outcomes**	**Attained (%)**

BS CH-201 (CHEMISTRY-I)	**CO1**	Analyse microscopic chemistry in terms of atomic and molecular orbitals and intermolecular forces to solve different engineering problems.	69
	CO2	Rationalise bulk properties and processes using thermodynamic consideration for various engineering applications.	72
	CO3	Distinguish the ranges of the electromagnetic spectrum used for exciting different molecular energy levels in various spectroscopic techniques.	78
	CO4	Rationalise periodic properties (ionization potential, electro negativity, oxidation states) for various engineering applications.	81
	CO5	Apply the knowledge of structure, stability and reactivity of organic molecular species in order to gain a clear insight into the mechanism of chemical and biochemical reacting systems used in various engineering problems.	82
BS-M201 (Mathematics-IIA)	**CO1**	To understand the concept of basic probability,including sample spaces,events,probability distribution,and conditional probability.	90
	CO2	Apply probability theory and statistical interference to solve engineering problems.	75
	CO3	Use statistical software and tools to analyze the data.	70
	CO4	Able to communicate their findings and results through written reports,and visual display	85
ES-CS201 (PROGRAMMING FOR PROBLEM SOLVING)	**CO1**	Design Algorithm, flow chart and program in C.	70
	CO2	Apply logical operators and loops in programming.	60
	CO3	Construct arrays using the concept of C programming.	70
	CO4	Analyze how to use arguments and return values and variables from a function.	65
	CO5	Use pointers for direct memory access and manipulation in C; and how to change the memory address contained within a pointer;	70
	CO6	Apply the programming concepts for manipulating strings in C and file handling.	60
HM-HU201 (ENGLISH)	**CO1**	To be able to **use** the correct vocabulary in order to express oneself in English properly	62
	CO2	To be able to **identify** common errors in terms of grammar and choice of words in English	58

	CO3	To be able to **describe**, **discuss**, and **interpret** reading input in English	75
	CO4	To be able to **demonstrate** that one can express oneself in English through writing	64
BS CH-291 (CHEMISTRY-I)	**CO1**	Organize/Design the experiment related to Chemical Science as applicable in various Engineering problems.	72
	CO2	Generate experimental Data related to Chemical Science as applicable in complex problems.	78
	CO3	Conduct actual experiment related to Chemical Science as applicable in different engineering application.	83
	CO4	Analyze data and draw conclusion related to Chemical Science as applicable in various engineering problems.	76
	CO5	Analyze with proper experimental data and graphs and communicate effectively related to Chemical Science as applicable in different engineering fields.	84
ES-CS291 (PROGRAMMING FOR PROBLEM SOLVING)	**CO1**	To formulate the algorithms for simple problems	90
	CO2	To translate given algorithms to a working and correct program	90
	CO3	To be able to correct syntax errors as reported by the compilers	80
	CO4	To be able to identify and correct logical errors encountered at run time	85
	CO5	To be able to write iterative as well as recursive programs	90
	CO6	To be able to represent data in arrays, strings and structures and manipulate them through a program	80
	CO7	To be able to declare pointers of different types and use them in defining self-referential structures.	75
	CO8	To be able to create, read and write to and from simple text files	80
ES-ME291 (Engineering Graphics & Design)	**CO1**	Develop basic knowledge of engineering drawing including lettering, dimensioning and scaling system.	75
	CO2	Develop basic knowledge on geometrical constructions and curves and apply the knowledge to solve real life problems.	70
	CO3	Learn the basic concept of orthographic and isometric projections related to design of engineering.	65

	CO4	Comprehend the basic knowledge of development of different types of surfaces and analyse their real-life applications.	65
HM-HU291 (LANGUAGE LABORATORY)	**CO1**	To be able to **describe, discuss**, and **interpret** the listening input in English	55
	CO2	To be able to **demonstrate** that one can express oneself in English through speaking	54
	CO3	To be able to **describe, discuss,** and **interpret** reading input in English	77
	CO4	To be able to **demonstrate** that one can express oneself in English through writing	67
FOURTH SEMESTER			
PAPER CODE (Name)	**CO No.**	**Course Outcomes**	**Attained (%)**
PCC-CS401 (DISCRETE MATHEMATICS)	**CO1**	To understand the basic concept of set,relation ,mapping	75
	CO2	To understand the POSET,Lattice	80
	CO3	To understand the basic concept of number theory.	75
	CO4	To understand graphs,cycle,trail,path	80
	CO5	To apply the graph colouring,chromatic number to solve engineering problems.	75
PCC-CS 402 (COMPUTER ARCHITECTURE)	**CO1**	To learn the basics of stored program concepts.	75
	CO2	To learn the principles of pipelining	85
	CO3	To learn mechanism of data storage	80
	CO4	To distinguish between the concepts of serial, parallel, pipeline architecture	70
PCC-CS403 FORMAL LANGUAGE AND AUTOMATA THEORY	**CO1**	Familiarize with formal notation for strings, languages and machines and Design finite automata to accept a set of strings of a language.	70
	CO2	Design hierarchy of formal languages, grammars and machines and Determine whether the given language is regular or not	65
	CO3	Design context free grammars to generate strings of context free language and Determine equivalence of languages accepted by Push Down Automata and languages generated by context free grammars	75
	CO4	Distinguish between computability and non-computability and Decidability and undecidability	65
PCC-CS404 DESIGN &	**CO1**	For a given algorithms analyse worst-case running times of algorithms based on asymptotic analysis and justify the correctness of algorithms.	85
	CO2	Describe the greedy paradigm and explain when an algorithmic design situation calls for it. For a given problem develop the greedy algorithms.	75
	CO3	Describe the divide-and-conquer paradigm and explain	70

ANALYSIS ALGORITHM,		when an algorithmic design situation calls for it. Synthesize divide-and-conquer algorithms. Derive and solve recurrence relation.	
	CO4	Describe the dynamic-programming paradigm and explain when an algorithmic design situation calls for it. For a given problems of dynamic-programming.	80
	CO5	Develop the dynamic programming algorithms, and analyse it to determine its computational complexity.	85
	CO6	For a given model engineering problem model it using graph and write the corresponding algorithm to solve the problems.	70
	CO7	Explain the ways to analyse randomized algorithms (expected running time, probability of error).	70
	CO8	Explain what an approximation algorithm is. Compute the approximation factor of an approximation algorithm (PTAS and FPTAS).	65
BSC 401 (BIOLOGY)	**CO1**	Describe how biological observations of 18th century lead to major discoveries and understand that the classification of organisms is based on morphological, biochemical or ecological parameters.	82%
	CO2	Highlight the concepts of recessiveness and dominance during the passage of genetic material from parent to offering.	81%
	CO3	Convey that all forms of life have the same building blocks and yet the manifestations are diverse.	78%
	CO4	Classify enzymes and distinguish between different mechanisms of enzyme action and identify DNA as a genetic material in the molecular basis of information transfer.	83%
	CO5	Analyse biological processes at the reductionistic level and apply thermodynamic principals to the biological systems.	75%
	CO6	Identify and classify microorganisms.	79%
MC 401 (ENVIRONMENTAL SCIENCES)	**CO1**	To apply the knowledge of air pollution in order to develop improved technologies to reduce the adverse effect of pollution on human health and environment.	80
	CO2	To apply the knowledge of water pollution in order to develop improved technologies for controlling water pollution and provide safe and clean drinking water to the society.	82
	CO3	To apply the knowledge of solid waste management in order to develop technologies for reducing, reusing and recycling the waste for the benefit of the society.	84
	CO4	To apply the knowledge of ecology for understanding the	80

		complex interrelationships between the biotic and abiotic components in different types of eco systems in order to ensure sustainable development and growth.	
	CO5	To identify and solve problems related to noise pollution and create awareness among people about its harmful effects and control measures.	88
	CO6	To foster greater community involvement and create social awareness about the important national and international legislations and protocols concerning the protection and conservation of environment.	89
PCC-CS 492 (COMPUTER ARCHITECTURE)	**CO1**	Practical experience on Xlinx	95
	CO2	Analyze the operational behaviour and applications of various gates, sequential and combinational circuits.	85
PCC-CS494 (DESIGN & ANALYSIS ALGORITHM)	**CO1**	Implement Divide and Conquer programming method with different examples	85
	CO2	Demonstrate Brunch and Bound programming method with different example	70
	CO3	Execute Backtracking programming method with different examples	70
	CO4	Demonstrate Greedy programming method with different examples	75
	CO5	Implement Graph Traversal Algorithm with different examples	60

SIXTH SEMESTER			
PAPER CODE (Name)	**CO No.**	**Course Outcomes**	**Attained (%)**
PCC-CS601 (DATABASE MANAGEMENT SYSTEMS)	CO1	Apply the knowledge of pure query language to write a query in relational algebra, relational calculus and construct the SQL queries for Open source and Commercial DBMS like MYSQL, ORACLE, and DB2. .	80
	CO2	Apply the knowledge of entity relationship models to design the database for a given requirement specification.	75
	CO3	Apply the knowledge of query optimization algorithms to optimize the execution time of	70

		a query.	
	CO4	Apply the knowledge of reducing anomalies during database design.	75
	CO5	Understand the transaction atomicity, consistency, isolation, durability for a given transaction-processing system and implement the isolation property based on concurrency control and serializability of scheduling.	70
	CO6	Understand different processes to secure the database.	65
PCC-CS602 (COMPUTER NETWORKS)	CO1	Illustrate of modern network architectures from a design and performance perspective.	70
	CO2	Justify the major concepts involved in wide-area networks (WANs), local area networks (LANs) and Wireless LANs (WLANs).	70
	CO3	Derive Topologies for the enhancement of OSI/ TCP IP protocol suite.	75
PEC-IT601 D (IMAGE PROCESSING)	**CO1**	Explain the fundamentals of digital image and its processing.	70
	CO2	Perform image enhancement techniques in spatial and frequency domain.	72
	CO3	Elucidate the mathematical modelling of image restoration and compression.	80
	CO4	Apply the concept of image segmentation.	60
	CO5	Describe object detection and recognition techniques.	75
PEC-IT602D (PATTERN RECOGNITION)	CO1	Explain and compare a variety of pattern classification, structural pattern recognition and pattern classifier combination techniques.	60
	CO2	Summarize, analyze, and relate research in the pattern recognition area verbally and in writing.	70
	CO3	Apply performance evaluation methods for pattern and critique comparisons of techniques made in the research literature.	75
	CO4	Apply pattern recognition techniques to real-world problems such as document analysis and recognition.	70
	CO5	Implement simple pattern classifiers, classifier combinations and structural pattern recognizers.	60
OEC-IT601B (HUMAN RESOURCE DEVELOPMENT AND ORGANIZATIONAL BEHAVIOR)	CO1	Critically assess existing theory and practice in the field of HRM.	75
	CO2	Develop an ability to undertake qualitative and quantitative research.	60
	CO3	Apply knowledge about qualitative and quantitative research to an independently constructed piece of work.	70
	CO4	Respond positively to problems in unfamiliar contexts.	75
	CO5	Identify and apply new ideas, methods	60

		and way of thinking.	
	CO6	Demonstrate competence in communicating and exchanging ideas in a group context.	60
PROJ - CS601 (RESEARCH METHODOLOGY)	CO1	Understand research problem formulation.	78
	CO2	Analyze research related information	82
	CO3	Follow research ethics	67
	CO4	Understand that today's world is controlled by Computer, Information Technology, but tomorrow's world will be ruled by ideas, concepts, and creativity.	79
	CO5	Understanding that when IPR would take such an important place in the growth of individuals & nations, it is needless to emphasize the need for information about Intellectual Property rights to be promoted among students in general & engineering in particular.	75
	CO6	Understanding that IPR protection provides an incentive to inventors for further research work and investment in R & D, which leads to creation of new and better products, and in turn brings about economic growth and social benefits.	85
PCC-CS691 (DATABASE MANAGEMENT SYSTEMS)	CO1	Apply the knowledge of pure query language to write a query in relational algebra, relational calculus and construct the SQL queries for Open source and Commercial DBMS like MYSQL, ORACLE, and DB2. .	80
	CO2	Apply the knowledge of entity relationship models to design the database for a given requirement specification.	75
	CO3	Apply the knowledge of query optimization algorithms to optimize the execution time of a query.	70
	CO4	Apply the knowledge of reducing anomalies during database design.	75
	CO5	Understand the transaction atomicity, consistency, isolation, durability for a given transaction-processing system and implement the isolation property based on concurrency control and serializability of scheduling.	70
	CO6	Understand different processes to secure the database.	65
	CO1	Understand the structure and	90

PCC-CS692 (COMPUTER NETWORKS)		organization of computer networks; including the division into network layers, role of each layer, and relationships between the layers, various network command, and network device.	
	CO2	Understand IPAddressing, Subnetting.	90
	CO3	Understand of transport layer concepts and protocol design; including connection oriented and connection-less models, techniques to provide reliable data delivery and algorithms for congestion control and flow control.	90
	CO4	Understand of Application layer concepts and protocol design.	80

MBA Department
CO ATTAINMENT
2021-2022

Subject Code & Subject Name	COs	Attainment
MB 101 Managerial Economics (Micro)	CO1:To explain and demonstrate the different types of markets and features – Price determination under different markets along with concepts like Law of Variable Proportions and Returns to S Producers equilibrium with the help of Isoquants, Expansion path Elasticity of Substitution.	83%
	CO2: To acquire knowledge and develop ideas of these concepts in detail and analyse the applicability in real life situations.	85%
MB 102 ORGANIZATIONAL BEHAVIOUR	CO1: The student will be able to evaluate and analyse the various facets of organisationbehaviour including personality, perception, and attitude and job satisfaction.	92%
	CO2 : The student will be able to understand the various organisation theories and analyse group behaviour, conflict, change and leadership concepts.	83%
MB 103 Business Communication	CO 1 To demonstratecompetenceinverbalbusinesscommunication &"ProcessofCommunicationinanorganization"	83%
	CO2 To demonstratecompetenceinthefundamentalsofbusiness writing & willenablethestudentstoaugmenttheirreportwritingskills	84%
	CO3 ItwillhelpthemtoidentifytheBarriersofCommunication and measures to overcome.	83%
	CO4 Itwillenable themtoapply the expertise to frame professional cover letter and professional resume.	82%
MB 104	CO1: Student will develop an understanding of different conditions & warranties, the passing of ownership rights by applying the knowledge of the Sale of goods Act and different types of negotiable instruments in different socio environmental situations.	80%
	CO2: Analysis of companies formation, memorandum, articles, and prospectus will be done to the students for their proper understanding of the Companies Act. Consumer protection act is analyzed to them for	81%

	them to remember and if required to apply in real-life scenarios.Illustration of inflation and its impact on business, unfair trade practice for better understanding of the business	
MB 105	CO1 Students will be able to contemplate the ethical standards to be maintained in professional set ups.	85%
	CO2 Students will be able to analyze Indian values related to business enterprises and merge them with relevant global concepts.	84%
	CO3 Students will be able to work comfortably in the professional world.	86%
	CO4 Students will be able to emerge as successful Managers/ leaders and lead a bright life.	84%
MB 106	CO1 Understanding the concept of business or industry related operational problems and then applying the knowledge Operations Research to solve it.	
	CO2 Understanding the concept of Probability and Statistics to analyze the problems of Business processes.	65%

Subject Code & Subject Name	**COs**	**Attainment**
MB 301 : ENTREPRENEURSHIP & PROJECT MANAGEMENT	CO1: Understand the concept of management, Organization, planning, Staffing and learn the Project evaluation, termination, and controlling process	82%
	CO2: To evaluate the role of entrepreneurs in economic development, and barriers, Identification of business opportunities, and feasibility studies.	98%
MB 302 Corporate	CO1To understand and apply the methods of environmental scanning, strategic planning techniques & formulation strategies	81%

Strategy	for holistic strategic management in organization.	
	CO2 To analyze and evaluate the strategic actions, strategic implementation and evaluation strategies.	83%
HRM 301 TEAM DYNAMICS AT WORK	CO1: be able to understand the meaning of group dynamics and evaluate the concepts and theories behind the group formations including the Schachter Study and its implications.	93%
	CO2: The student will be able to evaluate effective team building strategies and apply knowledge in solving contemporary issues related with teams in modern organisations	93%
HRM 304 Organizational Design	CO1: To apply organization theory for better understanding of organizational structure and design	83%
	CO2: To analyze different organizational models for reshaping organizations.	82%
MM 302: Digital & Social Media Marketing	CO1: To explain the understanding of digital & social media marketing plan that will address common marketing challenges	81%
	CO2: Applying concepts, approaches & the practical aspects of various digital & social media marketing tools like SEO, Paid Search, Social, Mobile, Email & Display media & marketing analytics	81%
	CO3: Analyze key performance indicators tied to any digital & social Media program & Develop return on investment model for any digital & social marketing program	78%
	CO4: Apply creative ideas or evolve with existing ideas for development of effective digital & social marketing communication	82%
MM 303 :Integrated Marketing Communication	CO1: To explain the understanding of essential concepts & techniques for the development & designing of an effective IMC program	82%
	CO2: Applying concepts, approaches & the practical aspects of various communication tools	82%
	CO3: Analyze effectiveness of different IMC tools for business firms	77%
	CO4: Apply creative ideas for development of effective marketing communication	82%
FM 302 Project	CO1: To define the Project life cycle, the role of stakeholders and pr	77%

Appraisal and Finance	management processes and to explain the concepts of pr specifications, financial projections, scope and team in Pr management.	
	CO2: To describe and evaluate the risks involved in projects and associated costs as demonstrate the control and closure process relat project management.	75%
FM 304 Corporate Finance	CO1:To define and discuss the concepts & theories related to financial management.	77%
	CO2:To describe and apply the various theories, tools and techniques of Corporate Finance to resolve real life financial problems	75%

Subject Code & Subject Name	COs	Attainment
MB 201 Indian Economy and Policy	CO1: To Explain and design the concepts of circular flow, theo income determination, inflation, unemployment, LPG model, as w banking, trade policy and monetary reforms.	85%
	CO2: To Develop ideas of the Indian Economy and grasp the import of planning undertaken by the government of India.	83%
MB 202 Financial Reporting, Statement and Analysis	CO1: To explain the understanding of the concepts and apply the practical life like basic financial accounting concept, preparing boo accounts, introduction of Accounting Standard, preparation of fina statements and its analysis.	71%
	CO2: To Summarize the financial transactions in terms of Fina Statements and interpret Financial Statements by using diff financial tools and techniques.	74%
MB 203: Marketing Management	CO1: To identify & analyze the scope & significance of marketing in Domain Industry	80%
	CO2: To Analyze & examine marketing concepts & phenomenon to current business events in the industry	79%
	CO3: Map the various marketing environment variables & demonstrate them for designing marketing strategies for business firms	80%
	CO4: Demonstrate market analysis skill for developing innovative marketing strategies for firms	79%

MB 204 : OPERATIONS MANAGEMENT	CO1: To understand the suitable control technique in stores, Inventory, and vendor management is adopted for the production is identified.	80%
	CO2: To analyze the scheduling techniques applied in the operations were learned by the students	75%
MB 205 MANAGEMENT INFORMATION SYSTEM	CO1: To identify the technologies and methods used for effective decision-making in an organization	92%
	CO2: Make students understand the concepts and terminologies used in Database Management, Systems, SQL, Concurrency Management, and the extended part of data storage technology,Data Warehousing.	96%
MB 206 : HUMAN RESOURCE MANAGEMENT	CO1: The student will be able to understand and apply the various concepts behind Human Resource Management and development including planning, Performance Appraisal Systems and strategic HR management.	95%
	CO2: The student will be able to understand and apply the theories and strategic concepts behind compensation Management, Industrial Relations and discipline including workers participation in management.	85%

4th Semester

Subject Code & Subject Name	COs	Attainment
HR 401 MANPOWER PLANNING, RECRUITMENT& SELECTION	CO1: Student will be able to understand and analyze the various manpower planning mechanisms in an organization including forecasting techniques, management information systems and human resources audits.	93%
	CO2: Student will be able to apply and exercise various HRM implementation strategies including recruitment and solve case studies pertaining to real life organisational issues and situations.	93%
HR402Employee Relations &Labour Laws	CO1:To understand EPM,WPM ,concept of collective bargaining,trade unionism in India	84%
	CO2:To apply the various labour legislations in real life industrial scenario	79%
HR 404Performance Management System	CO1: To identify and apply performance planning ,monitoring, appraisal techniques & strategies for better performance management.	83%
	CO2: To understand balance scorecard, competency mapping for application in reward management, employee engagement and	82%

	potential appraisal	
HR 406 INTERNATIONAL HRM	CO1: Student will be able to understand International human resources management and development including the recruitment processes of such candidates.	93%
	CO2: The student will be able to remember and apply legislative measures meant for industrial relations, CSR and employee representation in the international sector and create compensation plans commensurate with the same.	93%
MM 401	CO1:Analysis consumer behaviour and its Impact on marketing strategies. Illustration of consumer decision process.Studednts will be understanding demographic and psychographic characteristics and market segmentation.Analysis of the relation between consumer perception with marketing stimuli.Students will learn to apply the knowledge of consumer motivation for marketing strategy and its relation with corporate social responsibility.	82%
	CO2: Students will develop the understanding of characteristics and functions of attitude, cross-cultural understanding of consumer behaviour and data analysis for consumer feedback researches.Students will comprehend and write effective technical reports. They will be able to analyse case studies,explain relevant materials,communicate effectively, identify the appropriate key words,use grammatically correct English for documentation.	85%
MM 403: Sales & Distribution Management	CO1: To explain the understanding of sales & distribution processes in Organization	77%
	To get familiarized with concepts, approaches & the practical aspects of the key decision-making variables in sales management & distribution channel management	75%
	CO3: To explain market analysis methods & selling concepts	78%
	CO4: To develop Performance evaluation methods, ethics, trends in sales & distribution management	76%
MM 404: Service Marketing	CO1: To explain the understanding of types, nature, classification & marketing mix of service marketing	77%
	CO2: Analyze service product concept, branding & service positioning that transforming service marketing to a great extent	75%
	CO3: To explain market analysis methods of service marketing	78%
	CO4: Demonstrate the role of identifying the people in service & the role of customer in service delivery	76%
MM 406:	CO1: To explain the understanding of global business	77%

International Marketing	activities, marketing processes in international business	
	To get familiarized with concepts, approaches & the practical aspects of the key decision-making variables & global forces that transforming international marketing	75%
	CO3: To develop general perspective about managing international marketing	76%
	CO4: To develop evaluation methods for International Marketing both in operational as well as strategic context	78%
OM 402 Behavioral Operations Management	CO1: To apply experimental learning theories & organizational behavior to ensure performance in work design	83%
	CO2: To understand emotional intelligence in operations management & supply chain management	82%
FM 401 Investment Analysis & Portfolio Management	CO1To explain the understanding of the concepts and apply them like portfolio diversification, Construction, portfolio management, portfolio revision, portfolio evaluation, portfolio protection, and portfolio performance measures.	77%
	CO2To implement strategies to make an impact on the students in taking investment decisions, and properly manage the portfolio.	75%
FM402 Managing Banks & Financial Institutions	CO1To explain the understanding of the concepts and apply them like banking industry models, bank support mechanism, Basel committee I & II, interest rate, risk management, liquidity management and credit risk management.	80%
	CO2 Evaluate and analyse the fundamentals & technical aspects of managing banks and financial institutions.	79%
FM405International Finance	CO1To explain the understanding of the concepts and apply them like international financial management, international monetary System, balance of payments, exchange rate determination and foreign exchange market.	75%
	CO2Evaluate and analyse the fundamentals & technical aspects of International financial market.	72%
FM406 Financial Markets and Services	CO1To Discuss the Indian Financial System and multiplicity of Financial Instruments and understand the Indian financial system, money market, secondary market, SEBI, mutual Funds and credit rating agencies.	76%
	CO2 Examine Mutual Funds and Merchant Banking under the nodal agency SEBI.	80%

Civil Engineering Department
CO ATTAINMENT
2021-2022

Paper Code (Name)	CO	COURSE OUTCOMES(COs)	ATTAINED (%)
1ST SEMESTER			
BS-PH101 Chemistry-I	**CO1**	Analyse microscopic chemistry in terms of atomic and molecular orbitals and intermolecular forces to solve different engineering problems.	72
	CO2	Rationalise bulk properties and processes using thermodynamic consideration for various engineering applications.	61
	CO3	Distinguish the ranges of the electromagnetic spectrum used for exciting different molecular energy levels in various spectroscopic techniques.	82
	CO4	Rationalise periodic properties (ionization potential, electro negativity, oxidation states) for various engineering applications.	87
	CO5	Apply the knowledge of structure, stability and reactivity of organic molecular species in order to gain a clear insight into the mechanism of chemical and biochemical reacting systems used in various engineering problems.	75
BS PH-101 (Physics-I)	**CO1**	Apply the knowledge of simple harmonic motion (ideal and real cases) and basic concepts of Mechanics for the solution of complex problems.	81
	CO2	Utilize the knowledge of vector calculus and different coordinate system for the solution of complex problems.	72%
	CO3	Apply the knowledge of physical optics (interference, diffraction, polarization) and LASER to solve different complex problems	75%
	CO4	Apply the knowledge of dielectric and magnetic properties of materials to interpret different complex systems.	83%
	CO5	Utilize the knowledge of Quantum Physics to analyze a complex engineering problem.	69%
	CO6	Apply the knowledge statistical mechanics to solve complex problems.	79%
BS-M101/ BS-M102 Mathematics –IA*/ Mathematics –IB *	**CO1**	Understand the properties of complex functions and their behavior. Know the techniques for evaluating complex integrals and series. Learn the theory of analytic functions, conformal mapping, the Cauchy-Riemann equations, concept of Taylor and Laurent series, complex integration, Liouville's theorem, residues and the Residue Theorem	75%
	CO2	Understand the concept of a differential equation and its solution. Know the techniques for solving first-order and second-order differential equations,	78%

		Cauchy-Euler differential equation, Bessel's equation, indicial equations, power-series solution.	
	CO3	Understand the concept of integration over two or three-dimensional regions/volumes. Know the techniques for evaluating double and triple integrals, including change of variables and polar, cylindrical, and spherical coordinates	78%
	CO4	Understand the statement of Stokes' theorem, Green's theorem and how to apply it to compute line integrals. Understand the concept of a curve and its parameterization. Know the techniques for evaluating line integrals, including parametric and vector forms. Understand the concept of a surface and its parameterization. Know the techniques for evaluating surface integrals, including parametric and vector forms. Understand volume integrals and Gauss divergence theorem.	74%
BS-PH191/ BS-CH191 Physics-I Laboratory (Gr-A)/ Chemistry-I Laboratory (Gr-B)	**CO1**	Organize/Design the experiment related to Chemical Science as applicable in various Engineering problems.	71%
	CO2	Generate experimental Data related to Chemical Science as applicable in complex problems.	68%
	CO3	Conduct actual experiment related to Chemical Science as applicable in different engineering application.	78%
	CO4	Analyze data and draw conclusion related to Chemical Science as applicable in various engineering problems.	83%
	CO5	Analyze with proper experimental data and graphs and communicate effectively related to Chemical Science as applicable in different engineering fields.	85%
BS PH-191 (Physics-Lab 1)	**CO1**	Organize/design the experiment related to various systems and interpret the physical properties of material.	72%
	CO2	Generate experimental Data related to electrical and magnetic properties.	80%
	CO3	Conduct actual experiment related to optical phenomena.	78%
	CO4	Analyze data and draw conclusion related to quantum physics.	85%
	CO5	Analyze with proper experimental data and graphs and communicate effectively.	75%
ES-ME191/ ES-ME192 Engineering Graphics & Design (Gr-B)/ Workshop /Manufacturing Practices(Gr-A)	**CO1**	Introduction to engineering design and its place in society	87%
	CO2	Exposure to the visual aspects of engineering design	85%
	CO3	Exposure to engineering graphics standards	89%
	CO4	Exposure to solid modelling	84%
2ND SEMESTER			
BS-CH201	**CO1**	Analyse microscopic chemistry in terms of atomic and molecular orbitals	69%

Chemistry-I		and intermolecular forces to solve different engineering problems.	
	CO2	Rationalise bulk properties and processes using thermodynamic consideration for various engineering applications.	72%
	CO3	Distinguish the ranges of the electromagnetic spectrum used for exciting different molecular energy levels in various spectroscopic techniques.	78%
	CO4	Rationalise periodic properties (ionization potential, electro negativity, oxidation states) for various engineering applications.	81%
	CO5	Apply the knowledge of structure, stability and reactivity of organic molecular species in order to gain a clear insight into the mechanism of chemical and biochemical reacting systems used in various engineering problems.	82%
BS PH-201 **(Physics-I)**	**CO1**	Apply the knowledge of simple harmonic motion (ideal and real cases) and basic concepts of Mechanics for the solution of complex problems.	82%
	CO2	Utilize the knowledge of vector calculus and different coordinate system for the solution of complex problems.	79%
	CO3	Apply the knowledge of physical optics (interference, diffraction, polarization) and LASER to solve different complex problems	74%
	CO4	Apply the knowledge of dielectric and magnetic properties of materials to interpret different complex systems.	86%
	CO5	Utilize the knowledge of Quantum Physics to analyze a complex engineering problem.	76%
	CO6	Apply the knowledge statistical mechanics to solve complex problems.	69%
BS-M201/ BS-M202 Mathematics –IIA# / Mathematics –IIB #	**CO1**	Understand the properties of complex functions and their behavior. Know the techniques for evaluating complex integrals and series. Learn the theory of analytic functions, conformal mapping, the Cauchy-Riemann equations, concept of Taylor and Laurent series, complex integration, Liouville's theorem, residues and the Residue Theorem.	85%
	CO2	Understand the concept of a differential equation and its solution. Know the techniques for solving first-order and second-order differential equations, Cauchy-Euler differential equation, Bessel's equation, indicial equations, power-series solution.	88%
	CO3	Understand the concept of integration over two or three-dimensional regions/volumes. Know the techniques for evaluating double and triple integrals, including change of variables and polar, cylindrical, and spherical coordinates	85%
	CO4	Understand the statement of Stokes' theorem, Green's theorem and how to apply it to compute line integrals. Understand the concept of a curve and its parameterization. Know the techniques for evaluating line integrals, including parametric and vector forms. Understand the concept of a surface and its parameterization. Know the techniques for evaluating surface	80%

		integrals, including parametric and vector forms. Understand volume integrals and Gauss divergence theorem.	
HM-HU201 English	**CO1**	to be able to **use** the correct vocabulary in order to express oneself in English properly	62%
	CO2	to be able to **identify** common errors in terms of grammar and choice of words in English	58%
	CO3	to be able to **describe**, **discuss**, and **interpret** reading input in English	75%
	CO4	to be able to **demonstrate** that one can express oneself in English through writing	64%
BS-PH291/ BS-CH291 Physics-I Laboratory(Gr B)/ Chemistry-I Lab(GrA)	**CO1**	Organize/Design the experiment related to Chemical Science as applicable in various Engineering problems.	72%
	CO2	Generate experimental Data related to Chemical Science as applicable in complex problems.	78%
	CO3	Conduct actual experiment related to Chemical Science as applicable in different engineering application.	83%
	CO4	Analyze data and draw conclusion related to Chemical Science as applicable in various engineering problems.	76%
	CO5	Analyze with proper experimental data and graphs and communicate effectively related to Chemical Science as applicable in different engineering fields.	84%
BS PH-291 (Physics-Lab 1)	**CO1**	Organize/design the experiment related to various systems and interpret the physical properties of material.	80%
	CO2	Generate experimental Data related to electrical and magnetic properties.	78%
	CO3	Conduct actual experiment related to optical phenomena.	85%
	CO4	Analyze data and draw conclusion related to quantum physics.	68%
	CO5	Analyze with proper experimental data and graphs and communicate effectively.	79%
ES-ME291/ ES-ME292 Engineering Graphics & Design(Gr-A)/ Workshop/Manufacturing Practices(GrB)	**CO1**	Introduction to engineering design and its place in society•	95%
	CO2	Exposure to the visual aspects of engineering design	95%
	CO3	Exposure to engineering graphics standards	95%
	CO4	Exposure to solid modelling	95%
HU291 Language Laboratory	**CO1**	to be able to **describe, discuss**, and **interpret** the listening input in English	55%
	CO2	to be able to **demonstrate** that one can express oneself in English through speaking	54%
	CO3	to be able to **describe, discuss,** and **interpret** reading input in English	77%
	CO4	to be able to **demonstrate** that one can express oneself in English through writing	67%

3RD SEMESTER			
CE(ES)302 **Energy Science**	**CO1**	Understanding the various sources of energy and its interaction with the environment	67%
	CO2	Designing energy efficient structures	67%
CE(HS)302 – INTRODUCTION TO CIVIL ENGINEERING	**CO1**	= To acquire knowledge about basic civil engineering techniques and apply the acquired knowledge in basic civil engineering problems..	77%
CE(ES)392 **Computer aided Civil Engineering Drawing**	**CO1**	To understand the concept of engineering drawings and apply the same using computer aided design technology	79%
4TH SEMESTER			
CE(ES)401 Introduction to Fluid Mechanics	**CO1**	To understand about the properties and characteristics of fluid	90.8%
	CO2	To understand, analyze and evaluate the different characteristics, pattern and types of fluid flow and hydraulic machines.	90.2%
CE(ES)40 Introduction to Solid Mechanics	**CO1**	Deterministic approaches for understanding interaction between material characteristic with load and time	89.9%
	CO2	Knowledge about materials and structures and understand their deformation under load and Mathematical representation of the structure property	89.6%
CE(PC)401- **Soil Mechanics** – I	**CO1**	To understand, evaluate and gather knowledge about physical properties of soil and analyze the soil-water interaction system.	93.3%

	CO2	To understand and analyze the stress distribution and shear strength characteristics of soils.	92.8%
CE(PC)402- Environmental engineering -I	**CO1**	Analyzing the sources, requirements, quality and treatment of water and design of the patterns of conveyance and distribution	92.2%
	CO2	Analyzing the characteristics of municipal solid waste and it's handling by engineering systems.	92.4%
CE(PC)403- Surveying and Geomatics	**CO1**	To understand the basic principles of surveying and geomatics	92.4%
	CO2	To evaluate the different techniques of surveying and geomatics in solving basic problems and also analyze different and advanced technique of surveying	92.2%
CE(PC)404- CONCRETE TECHNOLOGY	**CO1**	Understanding the properties , raw materials required for designing fresh and hardened concrete	92%
	CO2	Analysing the mix design of concrete	91%
CE(HS)401- CE-SOCIETAL and global impact	**CO1**	Understanding the historical perspectives in the overall development of civil engineering	92.5%
	CO2	Understanding the challenges of future civil engineering projects	92.8%
CE(ES)491- FLUID LABORATORY	**CO1**	Apply the knowledge of fluid characteristics for determination of various parameters related to fluid flow through experimentation.	94.4%
CE(ES)492- SOLID MECHANICS LABORATORY	**CO1**	Apply the knowledge of material characteristics to determine various strength parameters through experimentation.	94%
CE(ES)493- ENGGINEERING GEOLOGY LABORATORY	**CO1**	Apply the knowledge of Engineering Geology in determining the physical properties of rocks and minerals and to understand and delineate different geological structures by the interpretation of geological maps	94.4%

CE(PC)493-SURVEYING AND GEOMATICS LABORATORY	**CO1**	Application of the knowledge of surveying and geomatics for determination of different methods of surveying for measurement	94.3%
CE(PC)494-CONC LAB	**CO1**	Applying the knowledge of Concrete technology in determining the various parameters of Concrete and its design.	94.5%
5TH SEMESTER			
CE(PC)501-DESIGN OF RC STRUCTURES	**CO1**	To understand about the concept of limit state and working stress method of design.	70.4%
	CO2	To understand, analyze and evaluate about the design of different types of RC structures by Limit State Method and Working Stress Method.	70.2%
CE(PC)502 ENGINEERING HYDROLOGY	**CO1**	Understanding the basic concepts of Hydrology.	86.1%
	CO2	Analysis of different hydrological parameters and mitigation methods of floods and flood management.	85.8%
CE(PC)503-structURAL ANALYSIS -I	**CO1**	Knowledge of static , determinate and indeterminate structures	83.1%
	CO2	Analysis of all type of structure of its stability and instability	82.8%
CE(PC)504-SOIL MECHANICS - 2	**CO1**	To understand, evaluate and analyze about consolidation, compaction and earth pressures of soil.	85.1%
	CO2	To understand, analyze, evaluate the bearing capacity and settlement analysis of shallow foundation and slope stability analysis of any manmade or natural slope.	84.7%
	CO1	**Define the basic concepts and terminologies of waste water engineering, hazardous waste management, Plumbing systems for water supply**	90.3%

CE(PC)505-ENVIRONMENTAL ENGINEERING 2		**and waste water disposal**	
	CO2	Apply the methods of quantifying sanitary sewage and storm sewage, solve mathematical problems and design different processes operations involved in waste water treatment.	90%
CE(PC)506-TRANSPORTATION ENGINEERING	**CO1**	TO UNDERSTAND THE KNOWLEDGE OF PLANNING,DESIGN AND THE FUNDAMENTAL PROPERTIES OF HIGHWAY MATERIALS IN HIGHWAY ENGINEERING	94.2%
	CO2	APPLY AND INTERPRET THE KNOWLEDGE OF GEOMETRIC DESIGN AND TRAFFIC STUDIES	93.4%
CE(PC)591-RC DESIGN SESSIONAL	**CO1**	Apply the knowledge of RCC structure.	69.7%
CE(PC)594-SOIL MECHANICS LABORATORY	**CO1**	Understand every aspect of soil investigation and prepare a lab report	94.8%
CE(PC)595-ENVIRONMENTAL ENGINEERING LABORATORY	**CO1**	Organize/Design the experiment related to Digital Signal Processing Lab**.**	85.1%
CE(PC)596-TRANSPORTATION LABORATORY	**CO1**	TO understand the application of different laboratory tests.	86.4%
CE(PC)597-COMPUTER APPLICATION IN CIVIL ENGINEERING	**CO1**	Understanding Computer applications to apply in civil engineering field	94.06%

6TH SEMESTER

CE(PC)601-CONSTRUCTION ENGINEERING AND MANAGEMENT	**CO1**	To Understand how structures are built.	96%
	CO2	To evaluate the necessary steps for the completion of a project from the beginning to the end.	95%
CE(PC)602-ENGINEERING ECONOMICS,ESTIMATION AND COSTING	**CO1**	To understand the principles of economics and it's application on value analysis of civil engineering projects	78.7
	CO2	To understand the technical specifications of rate analysis, Tender and valuation performed for a project and analyse the cost of a structure through these parameters.	78.4
CE(PC)603-WATER RESOURCE ENGINEERING	**CO1**	To apply the fundamentals of flow in open channel to design them accordingly	90.17
	CO2	To understand the different concepts of Irrigation in connection with the water requirement for different crops and obtain knowledge about various ground water resources	89.37
CE(PC)604- DESIGN OF STEEL STRUCTURES	**CO1**	Understanding the properties and its utility in civil engineering design	83%
	CO2	Analysis of the use of steel in designing various structures	83%
CE(PE)601B-FOUNDATION ENGINEERING	**CO1**	Gain basic knowledge about the bearing capacity of shallow and deep foundation at site and gain some knowledge about soil investigation and exploration	84.2
	CO2	Analyse the design of sheet pile structure on the basis of earth pressure theories and understand and apply various types of ground improvement methods for solving complex geotechnical problems	84%
CE(PE)602A-BUILDING,CONSTRUCTION AND PRACTICE	**CO1**	Understand the knowledge of various structures that used in civil engineering construction	87.8

CE(PC)693-Water Resource Laboratory	**CO1**	To apply different techniques for proper use of water as an useful resource.	87%
CE(PC)694-STEEL STRUCTURE DESIGN SESSIONAL	**CO1**	Apply the knowledge of steel structure in design	74.7
CE(PC)695-QUANTITY SURVEYESTIMATION AND VALUATION SESSIONAL	**CO1**	To evaluate about the specification and valuation of works and materials used in any civil engineering construction project	79.3

7TH SEMESTER

CE(OE)701A-METRO SYSTEM AND ENGINEERING	**CO1**	understand the overview of how the metro system works	84.9%
	CO2	to apply the knowledge of different metro sysytem engineeirng works	84.5%
CE(PE)701C-HYDRAULIC STRUCTURES	**CO1**	To understand and evaluate about the characteristics of various types and components of dams and their selection procedure.	82.8%
	CO2	To analyze about the stability analysis of different hydraulic structures (dam) and estimate about different types of forces, seepage loss and discharge calculation acting on dams and their remedial measures .	82.1%
CE(PE)702A-PRESTRESS CONCRETE	**CO1**	Understanding the purpose, parameters and application of Prestressed Concrete structure	96.3
	CO2	Design of Prestressed Concrete Structures	96.4
CE(PE)703A-	**CO1**	Understanding the concepts of air and noise pollution, methods of their	91%

AIR AND NOISE POLLUTION		measurement.	
	CO2	Analyze the concepts of air and noise pollution solving mathematical problems and design techniques for air and noise pollution control	90.6%
CE(PE)704C-COASTAL HYDRAULICS AND SEDIMENT TRANSPORT	**CO1**	Understanding the various mechanisms involved in generation of tides, currents and waves and its implications on sediment transport.	80.6%
	CO2	Applying the knowledge of wave current mechanics and sediment transport in analyzing different shore line and coastal structures	80.26%
CE(PE)705A-RAILWAY AND AIRPORT ENGINEERING	**CO1**	to acquire the knowledge of basic railway engineering	72.2%
	CO2	to acquire the knowledge of basic airport engineering.	71.13%

8TH SEMESTER

CE(PE)801D PAVEMENT MATERIALS	**CO1**	To understand about the different materials for suitability of road and their availability characteristics.	77.6
	CO2	**To understand and evaluate the properties of soil and physical modification of pavement works**	77.3
CE(0E)801C DEEP FOUNDATION	**CO1**	To understand, evaluate and analyze about the selection of suitable type of deep foundation for various site conditions.	77.56
	CO2	To understand, analyze and evaluate the concept about bearing capacity of different types of deep foundations.	77

Course Details:

Course Name:	**Data Structure & Algorithm**
Course Code:	**PCC-CS301**
Name of the Program:	**B.Tech**
Department	**Computer Science Engineering**
Semester	**3rd Semester**

COURSE OUTCOME:

On successful completion of this course, students should be able to:

CO1	To learn and apply the basics of abstract data types.
CO2	To learn and apply the principles of linear and nonlinear data structures.
CO3	To build an application using sorting and searching.
CO4	Design applications with the knowledge of computation and principles of data structures.

Data Structure & Algorithm		CO	Attainment
	CO1	To learn and apply the basics of abstract data types.	10%
	CO2	To learn and apply the principles of linear and nonlinear data structures.	15%
	CO3	To build an application using sorting and searching.	15%
	CO4	Design applications with the knowledge of computation and principles of data structures.	25%

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		√	√									
CO2		√	√									
CO3			√		√							
CO4			√		√							

Course Details:

Course Name:	Data Structure & Algorithm Lab
Course Code:	PCC-CS391
Name of the Program:	B.Tech
Department	Computer Science Engineering
Semester	3rd Semester

COURSE OUTCOME:

On successful completion of this course, students should be able to:

CO1	Design and develop programs using data structure & algorithm concepts.
CO2	Develop simple applications using linear and non-linear data structures & algorithms concepts and understand the access mechanisms and other use and functionalities.
CO3	Implement searching and sorting concepts
CO4	Implement the concepts of graph and hashing

Data Structure & Algorithm Lab		CO	Attainment
	CO1	Design and develop programs using data structure & algorithm concepts.	15%
	CO2	Develop simple applications using linear and non-linear data structures & algorithms concepts and understand the access mechanisms and other use and functionalities.	10%
	CO3	Implement searching and sorting concepts.	10%
	CO4	Implement the concepts of graph and hashing	25%

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√	√									
CO2	√	√										
CO3		√			√							
CO4		√			√							

Course Details:

Course Name:	**Computer Organization**
Course Code:	**PCC-CS302**
Name of the Program:	**B.Tech**
Department	**Computer Science Engineering**
Semester	**3rd Semester**

COURSE OUTCOME:

On successful completion of this course, students should be able to:

CO1	Understand basic structure of digital computer, stored program concept and different arithmetic and control unit operations.
CO2	Understand basic structure of different combinational circuits- multiplexer, decoder, encoder etc.
CO3	Perform different operations with sequential circuits.
CO4	Understand memory and I/O operations.

Computer Organization		CO	Attainment
	CO1	Understand basic structure of digital computer, stored program concept and different arithmetic and control unit operations.	15%
	CO2	Understand basic structure of different combinational circuits- multiplexer, decoder, encoder etc.	15%
	CO3	Perform different operations with sequential circuits.	25%
	CO4	Understand memory and I/O operations.	10%

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1					√		√					
CO2					√		√					
CO3									√			
CO4					√		√					

Course Details:

Course Name:	**Computer Organization Lab**
Course Code:	**PCC-CS392**
Name of the Program:	**B.Tech**
Department	**Computer Science Engineering**
Semester	**3rd Semester**

COURSE OUTCOME:

On successful completion of this course, students should be able to:

CO1	Understand basic structure of digital computer, stored program concept and different arithmetic and control unit operations.
CO2	Understand basic structure of different combinational circuits- multiplexer, decoder, encoder etc.
CO3	Perform different operations with sequential circuits.
CO4	Understand memory and I/O operations.

Computer Organization Lab		CO	Attainment
	CO1	Understand basic structure of digital computer, stored program concept and different arithmetic and control unit operations.	10%
	CO2	Understand basic structure of different combinational circuits- multiplexer, decoder, encoder etc.	15%
	CO3	Perform different operations with sequential circuits.	15%
	CO4	Understand memory and I/O operations.	10%

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1					√		√					
CO2					√		√					
CO3									√			
CO4					√		√					

Course Details:

Course Name:	**Compiler Design**

Course Code:	**PCC-CS501**
Name of the Program:	**B.Tech**
Department	**Computer Science Engineering**
Semester	**5th Semester**

COURSE OUTCOME:

On successful completion of this course, students should be able to:

CO1	To apply the basic concept of compilers and discuss on the components as well as the strengths and weaknesses of various phases of designing a compiler.
CO2	To understand the role of finite automata in compiler design.
CO3	To design and analyze algorithms for syntactic or parsing techniques and semantic analysis of the process of designing compilers.
CO4	Apply the knowledge of Type Checking andRun-Time Environments in designing a compiler.
CO5	Apply the knowledge of Intermediate Code Generation, Code Optimization and Code Generations in designing a compiler.

COAttainmentofSubjects

		CO	Attainment
Compiler Design PCC-CS501	CO1	To apply the basic concept of compilers and discuss on the components as well as the strengths and weaknesses of various phases of designing a compiler.	5%
	CO2	To understand the role of finite automata in compiler design.	10%
	CO3	To design and analyze algorithms for syntactic or parsing techniques and semantic analysis of the process of designing compilers.	10%
	CO4	Apply the knowledge of Type Checking and Run-Time Environments in designing a compiler.	15%
	CO5	Apply the knowledge of Intermediate Code Generation, Code Optimization and Code Generations in designing a compiler.	15%

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√				√	√					√	
CO2					√		√					
CO3		√	√	√						√		
CO4	√	√			√	√	√				√	
CO5	√	√			√	√	√				√	

Course Details:

Course Name:	**Operating Systems**
Course Code:	**PCC-CS502**
Name of the Program:	**B.Tech**
Department	**Computer Science Engineering**
Semester	**5th Semester**

COURSE OUTCOME:

On successful completion of this course, students should be able to:

CO1	Understand processes and threads.
CO2	Design algorithms for process scheduling for a given specification of CPU utilization, Throughput, Turnaround Time, Waiting Time and Response Time.
CO3	For a given specification of memory organization develop the techniques for optimally allocating memory to processes by increasing memory utilization and for improving the access time. Design and implement file management system.

		CO	Attainment
Operating Systems	CO1	Understand processes and threads.	20%
	CO2	Design algorithms for process scheduling for a given specification of CPU utilization, Throughput, Turnaround Time, Waiting Time and Response Time.	15%
	CO3	For a given specification of memory organization develop the techniques for optimally allocating memory to processes by increasing memory utilization and for improving the access time. Design and implement file management system.	15%

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1					√		√					
CO2			√	√						√		
CO3			√	√			√			√		

Course Details:

Course Name:	**Operating System Lab**
Course Code:	**PCC-CS592**
Name of the Program:	**B.Tech**
Department	**Computer Science Engineering**
Semester	**5th Semester**

COURSE OUTCOME:

On successful completion of this course, students should be able to:

CO1	To Analyze different aspects of Linux.
CO2	To Create or design different scripts using shell programming.
CO3	To Create or design different scripts using shell programming.
CO4	Create shared memory with the implementation of reading from, write into shared memory.

CO Attainment of Subjects

		CO	Attainment
Operating System Lab PCC-CS592	CO1	To Analyze different aspects of Linux.	10%
	CO2	To Create or design different scripts using shell programming.	15%
	CO3	To Create or design different scripts using shell programming.	15%
	CO4	Create shared memory with the implementation of reading from, write into shared memory.	15%

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		√										
CO2			√	√						√		
CO3			√	√						√		
CO4				√								

Course Details:

Course Name:	**Object Oriented Programming**
Course Code:	**PCC-CS503**
Name of the Program:	**B.Tech**
Department	**Computer Science Engineering**
Semester	**5th Semester**

COURSE OUTCOME:

On successful completion of this course, students should be able to:

CO1	Specify simple abstract data types and design implementations, using abstraction functions to document them.
CO2	Recognize features of object-oriented design such as encapsulation, polymorphism, inheritance, and composition of systems based on object identity
CO3	Name and apply some common object-oriented design patterns and give examples of their use
CO4	Design applications with an event-driven graphical user interface.

COAttainmentofSubjects

		CO	Attainment
Object Oriented Programming	CO1	Specify simple abstract data types and design implementations, using abstraction functions to document them.	10%
	CO2	Recognize features of object-oriented design such as encapsulation, polymorphism, inheritance, and composition of systems based on object identity	15%
	CO3	Name and apply some common object-oriented design patterns and give examples of their use	15%
	CO4	Design applications with an event-driven graphical user interface.	5%

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		√	√									
CO2		√	√									
CO3			√		√							
CO4			√		√							

Course Details:

Course Name:	**Object Oriented Programming Lab**
Course Code:	**PCC-CS593**
Name of the Program:	**B.Tech**
Department	**Computer Science Engineering**
Semester	**5th Semester**

COURSE OUTCOME:

On successful completion of this course, students should be able to:

CO1	Design and develop java programs using object oriented programming concepts
CO2	Develop simple applications using object oriented concepts such as package, exceptions
CO3	Implement multi-threading, and generics concepts
CO4	Create GUIs and event driven programming applications for real world problems

CO Attainment of Subjects

Object Oriented Programming Lab		CO	Attainment
	CO1	Design and develop java programs using object oriented programming concepts	15%
	CO2	Develop simple applications using object oriented concepts such as package, exceptions	15%
	CO3	Implement multi-threading, and generics concepts	15%
	CO4	Create GUIs and event driven programming applications for real world problems	15%

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√	√									
CO2	√	√										
CO3		√			√							
CO4		√			√							

Course Details:

Course Name:	**Software Engineering**
Course Code:	**ESC 501**
Name of the Program:	**B.Tech**
Department	**Computer Science Engineering**
Semester	**5th Semester**

COURSE OUTCOME:

On successful completion of this course, students should be able to:

CO1	Apply basic SW engineering methods and practices different models, and their appropriate application, SRS Document.
CO2	Determine the role of project management including planning, scheduling, risk management, etc.
CO3	An understanding of software testing approaches such as unit testing and integration testing.
CO4	An understanding of software evolution and related issues such as version management.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√				√	√					√	
CO2			√	√						√		
CO3					√		√					
CO4					√		√					

CO AttainmentofSubjects

Software Engineering		CO	Attainment
	CO1	Apply basic SW engineering methods and practices different models, and their appropriate application, SRS Document.	15%
	CO2	Design the role of project management including planning, scheduling, risk management, etc.	15%
	CO3	An understanding of software testing approaches such as unit testing and integration testing.	15%
	CO4	An understanding of software evolution and related issues such as version management.	10%
PaperCode (Name)	**CO Number**	**Course Outcomes(CO)**	**ATTAINED**

HSMC301 Economics for Engineers	**CO1**	Analyze the economic decisions making, engineering costs & estimation and classification of costs by applying the knowledge of estimating models. Student will develop an understanding of cash-flow, Rate of return analysis in different socio-environmental situations.	15 %
	CO2	Analyze the inflation and price change would be done to the students for the proper understanding of the price-indexes in economic analysis. Effect of inflation & deflation is analyzed to them to remember and if required to apply in real-life scenarios.	25 %
	CO3	Recognize the types of property, depreciation and expenses and its impact on business,for better understanding of the business environment and apply the knowledge of it.	16 %

Mapping of Course Outcomes and Program Outcomes for the subject Economics for Engineers(HSMC301)

CourseOutcomes	Program Outcomes											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		✓		✓								
CO2		✓		✓								
CO3							✓					✓

PaperCode(Name)	CO Number	Course_Outcoms (CO)	ATTAINED
PEC-IT501B ArtificialInte lligence	CO1	Apply the goodprogramming skillsto formulate thesolutions forcomputationalpr oblems.	25%
	CO2	Design and developsolutions forinformed anduninformed searchproblemsinA I.	20%
	CO3	Understandandenric h knowledge toselect and apply AItools to synthesizeinformati on anddevelopmodelsw ithin constraints ofapplicationarea.	25%

Mapping of CourseOutcomes and ProgramOutcomesfor theArtificialIntelligence

CourseO utcomes	Program Outcome s											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	✓				✓	✓					✓	
CO2			✓	✓						✓		
CO3					✓		✓					

Paper Code(Name)	**CO Number**	**CourseOutcomes(CO)**	**ATTAINED**
HSMC501, Industrial Management	CO1	Analyze the concept of innovation andentrepreneurship,contributionsofentrepreneurstothe society,risk-opportunitiesperspectivebyapplyingtheknowledgeoffactorsaffectingthem.	25%
	CO2	Analyze the project management, issuesandproblemsinprojectmanagement, projectlife cycle-initiation/conceptualization phase, determination ofproject feasibility studies would be donetothestudents fortheirproper understandingofsocialcostbenefitanalysis.	20%
	CO3	Identification and illustration of thecritical path and its significance, types offloatsand slacksanditsimpactonbusiness, for better understanding of therecent trendsand applytheknowledge of it.	15%

MappingofCourseOutcomesandProgramOutcomesforthesubjectIndustrialManagement(HSMC501)

Course Outcomes	Program Outcomes											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		✓		✓								
CO2		✓		✓								
CO3		✓					✓					

PaperCode (Name)	CO Number	Course Outcomes(CO)	ATTAINED
PEC-IT501B Introductionto Philosophicalthoughts	CO1	Identifytheevaluation ofthehistoryof philosophy.	10%
	CO2	Identifyreligious concepts,traditions, andhistoricalpractices overtimeand across cultures.	25%
	CO3	Analyzecourse-related materialtoevaluatethe historicaldevelopment ofcontemporaryissues.	15%

MappingofCourseOutcomesandProgramOutcomesforthesubjectPhilosophicalthoughts(OEC-CS701B/C)

CourseOutcomes	ProgramOutcomes											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		✓										
CO2		✓										
CO3		✓		✓								

PaperCode (Name)	CO Number	Course Outcomes(CO)	ATTAINED

PEC-CS701B CloudComputing	CO1	Understand thefundamentalprincipl esofdistributedcomputi ng.	15%
	CO2	Understand theimportanc eof virtualizationin distributedcomputing andhowthishasenabled thedevelopmentofClou d Computing	20%
	CO3	Identifyanddefine technicalchallengesfor cloudapplicationsand assesstheirimportance.	15%

MappingofCourseOutcomesandProgramOutcomesforthesubjectCloudComputing(PEC-CS701B)

CourseO utcomes	ProgramOutcome s											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1							✓					
CO2							✓					
CO3		✓										

Course Details:

Course Name:	CyberSecurity
Course Code:	PEC-CS 702E
Name of the Program:	**B.Tech**
Department	**Computer Science Engineering**
Semester	**7th Semester**

PaperCode (Name)	CO Number	Course Outcomes(CO)	ATTAINED
PEC-CS702E CyberSecurity	CO1	Recognize andanalyzesoftware vulnerabilitiesandsecu ritysolutions toreduce the risk ofexploitation.	25%
	CO2	Design operational andstrategic cyber securitystrategiesand policies.	25%
	CO3	Implement cyber securitysolutionsanduse ofcybersecurity,inform ationassurance,andcybe r/computer forensicssoftware/tools.	10%

MappingofCourseOutcomesandProgramOutcomesforthesubjectCyberSecurity(PEC-CS702E)

CourseO utcomes	ProgramOutcome s											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		✓		✓								✓
CO2			✓	✓								
CO3				✓								

Paper Code(Name)	CO Number	CourseOutcomes(CO)	ATTAINED
	CO1	Analyzetheconceptofinnovationandent repreneurship,contributionsofentrepre neursto thesociety,risk-opportunities perspective by applyingtheknowledgeoffactorsaffecting them.	10%

HSMC701,Project ManagementandEntrepreneurship	CO2	Analyzetheproject management,issuesandproblems in projectmanagement,projectlife cycle-initiation/conceptualization phase, determinationof project feasibility studies will bedone tothe studentsfortheirproper understandingofsocialcostbenefitanalysis.	15%
	CO3	Identify and recognize the critical pathand its significance, types of floats andslacks and its impact on business, forbetterunderstanding oftherecent trends and applythe knowledgeofit.	25%

MappingofCourseOutcomesandProgramOutcomesforthesubjectProjectManagement and Entrepreneurship(HSMC701)

CourseOutcomes	ProgramOutcomes											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		✓		✓								
CO2		✓		✓								
CO3		✓										✓

Course Name:	**Design and Analysis of Algorithms**
Course Code:	**PCC-CS404**
Name of the Program:	**B.Tech**
Department	**Computer Science Engineering**
Semester	**4th Semester**

COURSE OUTCOME:

On successful completion of this course, students should be able to:

CO1	To analyze and identify the Complexity of a problem and compute the recurrence relation.
CO2	To analyze the several algorithms design techniques on some certain problems using divide & conquer method, dynamic programming approach and backtracking, greedy method.
CO3	To understand lower bound theory, graph traversal algorithm, network flow, disjoint set manipulation different method.
CO4	To design the algorithm of string matching problem, matrix manipulation algorithm.
CO5	To understand amortize analysis, approximation algorithm, notion of NP-completeness.

COAttainmentofSubjects

		CO	Attainment
Design and Analysis of Algorithms (PCC-CS404)	**CO1**	To analyze and identify the Complexity of a problem and compute the recurrence relation.	10%
	CO2	To analyze the several algorithms design techniques on some certain problems using divide & conquer method, dynamic programming approach and backtracking, greedy method.	15%
	CO3	To understand lower bound theory, graph traversal algorithm, network flow, disjoint set manipulation different method.	5%
	CO4	To design the algorithm of string matching problem, matrix manipulation algorithm.	15%
	CO5	To understand amortize analysis, approximation algorithm, notion of NP-completeness.	15%

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		√										
CO2		√	√	√						√		
CO3					√		√					
CO4			√	√						√		√
CO5					√		√					

Course Details

Course Name:	Design and Analysis of Algorithm Lab
Course Code:	**PCC-CS494**
Name of the Program:	**B.Tech**
Department	**Computer Science Engineering**
Semester	**4th Semester**

COURSE OUTCOME:

On successful completion of this course, students should be able to:

CO1	Design algorithm and implement C program using divide and conquer approach in Computer Science and Engineering and related fields.
CO2	Design algorithm and implement C program using dynamic programming in Computer Science and Engineering and related fields.
CO3	Design algorithm and implement C program using branch and bound method in Computer Science and Engineering and related fields.
CO4	Design algorithm and implement C program using backtracking in Computer Science and Engineering and related fields.
CO5	Design algorithm and implement C program using greedy method in Computer Science and Engineering and related fields.
CO6	Design Graph Traversal Algorithm and implement C program in Computer Science and Engineering and related fields.

COAttainment

		CO	Attainment
Design and Analysis of Algorithm Lab (PCC-CS494)	**CO1**	Design algorithm and implement C program using divide and conquer approach in Computer Science and Engineering and related fields.	15%
	CO2	Design algorithm and implement C program using dynamic programming in Computer Science and Engineering and related fields.	5%
	CO3	Design algorithm and implement C program using branch and bound method in Computer Science and Engineering and related fields. App	5%
	CO4	Design algorithm and implement C program using backtracking in Computer Science and Engineering and related fields.	15%
	CO5	Design algorithm and implement C program using greedy method	10%

		in Computer Science and Engineering and related fields.	
	CO6	Design Graph Traversal Algorithm and implement C program in Computer Science and Engineering and related fields.	15%

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			√	√						√		
CO2			√	√						√		
CO3			√	√						√		
CO4			√	√						√		
CO5			√	√						√		

Course Name:	**Computer Architecture**
Course Code:	**PCC-CS402**
Name of the Program:	**B.Tech**
Department	**Computer Science Engineering**
Semester	**4th Semester**

COURSE OUTCOME:

On successful completion of this course, students should be able to:

CO1	Design pipelining concepts with a prior knowledge of stored program methods
CO2	Design about memory hierarchy and mapping techniques
CO3	Understand parallel architecture and interconnection network

CO Attainment

		CO	**Attainment**
Computer Architecture (PCC-CS402)	**CO1**	Design pipelining concepts with a prior knowledge of stored program methods	10%
	CO2	Design about memory hierarchy and mapping techniques	25%
	CO3	Understand parallel architecture and interconnection network	25%

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			√	√						√		
CO2			√	√						√		
CO3					√		√					

Course Details

Course Name:	**Computer Architecture Lab**
Course Code:	**PCC-CS492**
Name of the Program:	**B.Tech**
Department	**Computer Science Engineering**
Semester	**4th Semester**

COURSE OUTCOME:

On successful completion of this course, students should be able to:

CO1	Design pipelining concepts with a prior knowledge of stored program methods
CO2	Design about memory hierarchy and mapping techniques
CO3	Understand of parallel architecture and interconnection network

CO Attainment

		CO	Attainment
Computer Architecture Lab (PCC-CS492)	**CO1**	Design pipelining concepts with a prior knowledge of stored program methods	10%
	CO2	Design about memory hierarchy and mapping techniques	25%
	CO3	Understand of parallel architecture and interconnection network	25%

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			√	√						√		
CO2			√	√						√		
CO3					√		√					

Course Details

Course Name:	Formal Language & Automata
Course Code:	PCC-CS403
Name of the Program:	B.Tech
Department	Computer Science Engineering
Semester	4th Semester

COURSE OUTCOME:

On successful completion of this course, students should be able to:

CO1	Formulate a formal notation for strings, languages and machines.
CO2	Design finite automata to accept a set of strings of a language
CO3	For a given language understand whether the given language is regular or not.
CO4	Design context free grammars to generate strings of context free language.
CO5	Understand equivalence of languages accepted by Push Down Automata and languages generated by context free grammars
CO6	Analyze the hierarchy of formal languages, grammars and machines.
CO7	Recognize between computability and non-computability and Decidability and undecidability.

CO Attainment

		CO	Attainment
Formal Language & Automata PCC-CS403)	**CO1**	Formulate a formal notation for strings, languages and machines.	**10%**
	CO2	Design finite automata to accept a set of strings of a language	**15%**
	CO3	For a given language understand whether the given language is regular or not.	**5%**
	CO4	Design context free grammars to generate strings of context free language.	**5%**
	CO5	Understand equivalence of languages accepted by Push Down Automata and languages generated by context free grammars	**10%**
	CO6	Analyze the hierarchy of formal languages, grammars and machines.	**10%**
	CO7	Recognize between computability and non-computability and Decidability and undecidability.	**5%**

MappingofCourseOutcomesandProgramOutcomesforthesubject**Formal Language & Automata**

PCC-CS403

CourseOutcomes	ProgramOutcomes											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		✓										
CO2			✓	✓						✓		
CO3					✓		✓					
CO4			✓	✓						✓		
CO5					✓		✓					
CO6		✓										
CO7												✓

Course Details

Course Name:	**DBMS**
Course Code:	**PCC-CS601**
Name of the Program:	**B.Tech**
Department	**Computer Science Engineering**
Semester	**6th Semester**

Course Outcome

On completion of the course students will be able to

1. Analyze a given query using relational algebra expressions and SQL for that query and optimize the developed expressions.

2. Design a given specification of the requirement design the databases using E R method and normalization.

3. Formulate a given transaction-processing system, determine the transaction atomicity, consistency, isolation, and durability.

4. Implement the isolation property, including locking, time stamping based on concurrency control and Serializability of scheduling.

CO Attainment

		CO	Attainment
DBMS	**CO1**	Analyze a given query using relational algebra expressions and SQL for that query and optimize the developed expressions.	20%
	CO2	Design a given specification of the requirement design the databases using E R method and normalization.	10%
	CO3	Formulate a given transaction-processing system, determine the transaction atomicity, consistency, isolation, and durability.	15%
	CO4	Implement the isolation property,	

		including locking, time stamping based on concurrency control and Serializability of scheduling.	14%

CO – PO Mapping

CourseOutcomes	ProgramOutcomes											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		✓										
CO2			✓	✓						✓		
CO3		✓										
CO4				✓								

Course Details

Course Name:	**DBMS LAB**
Course Code:	**PCC-CS691**
Name of the Program:	**B.Tech**
Department	**Computer Science Engineering**
Semester	**6th Semester**

COURSE OUTCOMES

1 Infer database language commands to create simple database.

2 Analyse the database using queries to retrieve records.

3 Applying PL/SQL for processing database.

4 Develop solutions using database concepts for real time requirements.

CO Attainment

DBMS LAB		CO	Attainment
	CO1	Understand HTML and Infer database language commands to create simple database.	10%
	CO2	Analyze the database using queries to retrieve records.	20%
	CO3	Applying PL/SQL for processing database.	15%
	CO4	Develop solutions using database concepts for real time requirements.	20%

CO – PO Mapping

CourseOutcomes	ProgramOutcomes											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1					✓		✓					
CO2		✓								✓		
CO3	✓				✓	✓					✓	
CO4							✓					

Course Details:

Course Name:	**Computer Networks**
Course Code:	**PCC-CS602**
Name of the Program:	**B.Tech**
Department	**Computer Science Engineering**
Semester	**6th Semester**

COURSE OUTCOME:

On successful completion of this course, students should be able to:

CO1	To develop an understanding of modern network s from a design and performance perspective.
CO2	To introduce the student to the major concepts involved in wide-area networks (WANs), local area networks (LANs) and Wireless LANs (WLANs)
CO3	To provide an opportunity to do network programming
CO4	To provide a WLAN measurement ideas.

CO Attainment

		CO	Attainment
Computer Networks (PCC-CS602)	CO1	To develop an understanding of modern network s from a design and performance perspective.	10%
	CO2	To introduce the student to the major concepts involved in wide-area networks (WANs), local area networks (LANs) and Wireless LANs (WLANs)	20%
	CO3	To provide an opportunity to do network programming	15%
	CO4	To provide a WLAN measurement ideas.	10%

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			√		√							
CO2	√	√			√							
CO3				√	√							
CO4				√	√							

Course Details:

Course Name:	ComputerNetworksLab
Course Code:	PCC-CS692
Name of the Program:	**B.Tech**
Department	**Computer Science Engineering**
Semester	**6th Semester**

COURSEOUTCOMES

Aftercompletionofcourse,studentswouldbeableto:

1. Identifyandusevariousnetworkingcomponents.
2. Analyzeperformance ofvariouscommunicationprotocols.
3. Understandthetransportlayerconceptsandprotocoldesignincludingconnectionorientedandconnection-less models.
4. Implementdevicesharingonnetwork.

COAttainmentofSubjects

Paper Code(Name)	**CO Number**	**Course Outcomes(CO)**	**ATTAINED**
ComputerNetworks Lab Code:PCC-CS692	CO1	Identify and understand of Various networking components.	10%
	CO2	Analyze the performance of Various communication protocols.	15%
	CO3	Understand the transport Layer concepts and Protocol design including Connection oriented and Connectionless models.	10%
	CO4	Implement device sharing On network.	20%

MappingofCourseOutcomesandProgramOutcomesforthesubjectComputerNetworkLab(PCC-CS692)

Course Outcomes	Program Outcomes											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		1					1					
CO2		1		1								
CO3							1					
CO4				1								

perCode (Name)	**CO Number**	**Course Outcomes(CO)**	**ATTAINED**
PROJ-CS601 Research Methodology	CO1	Identifyanddiscusstheissues andconcepts salienttotheresearch process.	15%
	CO2	Analysisofcomplex issuesinherentin selectingaresearch problem,selectingan appropriateresearch design,andimplementing aresearchproject.	20%
	CO3	Understand,compre hendand explainresearch articlesintheir academicdiscipline.	15%

MappingofCourseOutcomesandProgramOutcomesforthesubjectResearchMethodology(PROJ-CS601)

CourseOutcomes	ProgramOutcomes											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		✓										
CO2		✓		✓								
CO3							✓					

COAttainment

		CO	Attainment
Design and Analysis of Algorithm Lab (PCC-CS494)	**CO1**	Design algorithm and implement C program using divide and conquer approach in Computer Science and Engineering and related fields.	15%
	CO2	Design algorithm and implement C program using dynamic programming in Computer Science and Engineering and related fields.	15%
	CO3	Design algorithm and implement C program using branch and bound method in Computer Science and Engineering and related fields. App	5%
	CO4	Design algorithm and implement C program using backtracking in Computer Science and Engineering and related fields.	5%
	CO5	Design algorithm and implement C program using greedy method in Computer Science and Engineering and related fields.	10%
	CO6	Design Graph Traversal Algorithm and implement C program in Computer Science and Engineering and related fields.	15%

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			√	√						√		
CO2			√	√						√		
CO3			√	√						√		
CO4			√	√						√		
CO5			√	√						√		

Course Name:	**Image Processing**
Course Code:	**PEC-IT601D**
Name of the Program:	**B.Tech**
Department	**Computer Science Engineering**

Semester	**6th Semester**
Name of Faculty	**Suman Halder**

COURSE OUTCOME:
On successful completion of this course, students should be able to:

CO1	Review the fundamental concepts of a digital image processing system.
CO2	Analyze images in the spatial and frequency domain using various transforms.
CO3	Evaluate the techniques for image enhancement and image restoration.
CO4	Interpret image segmentation and representation techniques.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			√		√							
CO2	√	√			√							
CO3				√	√							
CO4				√	√							

Course Details

Course Name:	**Pattern Recognition**
Course Code:	**PEC-IT602D**
Name of the Program:	**B.Tech**
Department	**Computer Science Engineering**
Semester	**6th Semester**
Name of Faculty	**SD**

COURSE OUTCOME:
On successful completion of this course, students should be able to:

CO1	Understand and compare a variety of pattern classification, structural pattern recognition and pattern classifier combination techniques.
CO2	Summarize, analyze, and relate research in the pattern recognition area verbally and in writing.
CO3	Apply performance evaluation methods for pattern and critique comparisons of techniques made in the research literature.
CO4	Apply pattern recognition techniques to real-world problems such as document analysis and recognition.
CO5	Implement simple pattern classifiers, classifier combinations and structural pattern recognizers.
CO6	Able to manipulate Bayes' Classifier and implement Decision Trees.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1					√		√					
CO2		√		√								
CO3	√				√	√					√	
CO4	√				√	√					√	
CO5				√								

COAttainmentofSubjects

		CO	**Attainment**
Pattern Recognition PEC-IT602D	**CO1**	Understand and compare a variety of pattern classification, structural pattern recognition and pattern classifier combination techniques.	15%
	CO2	Summarize, analyze, and relate research in the pattern recognition area verbally and in writing.	15%
	CO3	Apply performance evaluation methods for pattern and critique comparisons of techniques made in the research literature.	5%
	CO4	Apply pattern recognition techniques to real-world problems such as document analysis and recognition.	15%
	CO5	Implement simple pattern classifiers, classifier combinations and structural pattern recognizers.	10%
	CO6	Able to manipulate Bayes' Classifier and implement Decision Trees.	5%

CO Attainment of Human Resource Development and Organizational Behavior(OEC-IT601B)

Paper Code(Name)	**CO Number**	**CourseOutcomes(CO)**	**ATTAINED**
OEC-IT601B	CO1	Understand the organizational structures, the Features and principles of organization. Analysis of the theories of motivation ,and Applying the knowledge in the organizational Level and in different socio-environmental Legal situations.	15%

Human Resource Development and Organizational Behavior	CO2	Understand and recognize different leadership in different social situations. Analysis of concept of Group Dynamic be done to the Students for their proper understanding and to apply in real-life scenarios.	15%
	CO3	Recognize the factors of organizational Change and its impact on business, better Understanding of the business environment With respect to resistance to change and apply The knowledge of it in different problems.	25%

Mapping of CourseOutcomes and ProgramOutcomesfor thesubjectHumanResourceDevelopmentandOrganizationalBehavior(OEC-IT601B)

CourseOutcomes	ProgramOutcomes											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		✓		✓			✓					
CO2		✓		✓			✓					
CO3							✓					✓

Cryptography & Network Security (CS801D)

Course Outcomes:

CO1: To be able to identify common network security vulnerabilities/attacks; explain the foundations of Cryptography and network security.

CO2: To be able to analyze the risks and threats to networked computers.

CO3: To be able to demonstrate detailed knowledge of the role of encryption to protect data.

CO4: To be able to analyze security issues arising from the use of certain types of technologies.

CO5: To be able to identify the appropriate procedures required to secure networks, system security testing and procedures of Backup and Recovery.

Paper Code(Name)	**CO Number**	**CourseOutcomes(CO)**	**ATTAINED**
OEC-IT601B HumanResource Developmentand OrganizationalBehavior	CO1	To be able to identify common network security vulnerabilities/attacks; explain the foundations of Cryptography and network security.	25%
	CO2	To be able to analyze the risks and threats to networked computers.	25%
	CO3	To be able to demonstrate detailed knowledge of the role of encryption to protect data.	20%

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		√										
CO2		√		√								
CO3	√	√				√	√					

CO4		√										

Course Details:

Course Name:	**E-Commerce & ERP**
Course Code:	**OEC-CS802A**
Name of the Program:	**B.Tech**
Department	**Computer Science Engineering**
Semester	**8th Semester**
Name of Faculty	**SD**

COURSE OUTCOME:

On successful completion of this course, students should be able to:

CO1	To identify and differentiate various types of Ecommerce.
CO2	To define and understand E-business and its Models.
CO3	To apply appropriate techniques and resources of Hardware and Software Technologies for Ecommerce.
CO4	To understand the basic concepts of ERP and identify different technologies used in ERP.
CO5	To apply different tools used in ER.

COAttainment

		CO	**Attainment**
E-Commerce & ERP OEC-CS802A	**CO1**	To identify and differentiate various types of Ecommerce.	10%
	CO2	To define and understand E-business and its Models.	15%
	CO3	To apply appropriate techniques and resources of Hardware and Software Technologies for Ecommerce.	10%
	CO4	To understand the basic concepts of ERP and identify different technologies used in ERP.	10%
	CO5	To apply different tools used in ER.	15%

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1				√								
CO2					√		√					
CO3	√				√	√					√	
CO4					√		√					
CO5	√				√	√					√	

PaperCode (Name)	**CO Number**	**Course Outcomes(CO)**	**ATTAINED**
OEC-CS801E, Soft Skill &Interpersonal Communication	CO1	Understand the importance of Behavioral aspects in the workplace	10%
	CO2	Recognize the conflict resolution skills at work	17%
	CO3	Understand the importance of Communication skills in daily life And at work	25%

Mapping of Course Outcomes and Program Outcomes for the subject Soft Skill &Interpersonal Communication(OEC-CS801E)

Course Outcomes	Program Outcomes											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1							✓					
CO2												✓
CO3							✓					

PAPER NAME	CO No.	Course Outcomes	Attainment
BIOLOGY (BSC-401)	CO1	Describe how biological observations of 18th century lead to major discoveries and understand that the classification of organisms is based on morphological, biochemical or ecological	10%

		parameters.	
	CO2	Highlight the concepts of excessiveness and dominance during the passage of genetic material from parent to offspring.	24%
	CO3	Convey that all forms of life have the same building blocks and yet the manifestations are diverse.	5%
	CO4	Classify enzymes and distinguish between different mechanisms of enzyme action and identify DNA as a genetic material in the molecular basis of information transfer.	10%
	CO5	Analyze biological processes at the reductionist level and apply thermodynamic principals to the biological systems.	10%

Mapping of Course Outcomes and Program Outcomes for the subject BIOLOGY (BSC-401)

Course Outcomes	Program Outcomes											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1					✓		✓					
CO2				✓			✓					✓
CO3		✓										✓
CO4												✓
CO4		✓										

PO NO.	BROAD	ELABORATE
1	Engineering knowledge	engineering fundam
2	Problem analysis:	Identify, formulate, research literature, and analyse complex engineering problems reaching substantiated conclusions usi
3	Design/development of	Design solutions for complex engineering problems and desig public health and safety, and cultural, societal, and environme
4	Conduct investigations of complex	Use research-based knowledge and research methods includ interpretation of data, and synthesis of the information to prov
5	Modern tool usage:	Create, select, and apply appropriate techniques, resources, a activities, with an understanding of the limitations.
6	The engineer and society:	Apply reasoning informed by the contextual knowledge to ass the professional engineering practice.
7	Environment and sustainability:	Understand the impact of the professional engineering solutio development.
8	Ethics:	Apply ethical principles and commit to professional ethics and
9	Individual and team work:	Function effectively as an individual, and as a member or lea
10	Communication:	Communicate effectively on complex engineering activities wi write effective reports and design documentation, make effect
11	Project management	Demonstrate knowledge and understanding of t h e engineer to manage projects and in multidisciplinary environments
12	Life-long learning:	Recognise the need for, and have the preparation and ability

PROGRAM SPECIFIC OUTCOMES

PSO1: Ability to apply the knowledge of Basic Computing, Basic Sciences and Social Sciences in the field of electrical engineering to identify, analyze and s life problems faced in industries and/or during research work.

PSO2: Ability to model, test, analyze and design components or processes rel modern power system involving both conventional and renewable energy reso voltage systems and energy management.

PSO3: Ability to apply the concept of circuit theory, electromagnetic field theo and basic electronics to solve complex problems of electrical machines and dri power electronic converters and electrical system design.

PSO4: Ability to identify and analyze the role of measurement, instrumentatic modern control engineering to enhance sustainability, reliability and efficiency electrical systems.
PSO5: Ability to demonstrate proficiency in operating and handling modern er tools to cop up with dynamic industrial environment.
PSO6: Ability to work and communicate effectively in the corporate life keepir responsible outlook towards socio-economic and environmental issues.

JRSE OUTCOMES

Nam

CO1	describe different type of networks, sources and signals with examples.
CO2	explain different network theorems, coupled circuit and tools for solution
CO3	apply network theorems and different tools to solve network problems.
CO4	select suitable techniques of network analysis for efficient solution.
CO5	estimate parameters of two-port networks.
CO6	design filter circuits.

Na

CO1	1. describe analog electronic components and analog electronics circuits
CO2	2. explain principle of operation of analog electronic components, filters,
CO3	3. compute parameters and operating points of analog electronic circuits.
CO4	4. determine response of analog electronic circuits.
CO5	5. distinguish different types amplifier and different types oscillators base
CO6	6. construct operational amplifier based circuits for different applications.

Name of

CO1	1. Relate different coordinate systems for efficient solution of electromag
CO2	2. describe mathematical s tools to solve electromagnetic problems.
CO3	3. explain laws applied to electromagnetic field.
CO4	4. apply mathematical tools and laws to solve electromagnetic problems.
CO5	5. analyze electromagnetic wave propagation
CO6	6. estimate transmission line parameters

Nam

Course	After completing this course, the students will be able to:
CO1	explain the co-ordinate system, principle of three dimensional rotation,kir
CO2	elaborate the theory of general motion, bending moment, torsional motio
CO3	develop free body diagram of different arrangements.

CO4	solve problems with the application of theories and principle of motion , fr
CO5	analyze torsional motion and bending moment.

N

CO1	explain basics of probability theories, rules, distribution and properties of
CO2	describe different methods of numerical analysis.
CO3	solve numerical problems based on probability theories , numerical analys
CO4	apply numerical methods to solve engineering problems.
CO5	5. solve engineering problems using z transform and probability theory.

Nam

Course	Upon completion of this course, students will be able to:
CO1	Describe with examples the biological observations lead to major discover
CO2	Explain the classification of kingdom of life the building blocks of life
CO3	Different techniques of bio physics used to study biological phenomena.
CO4	The role of imaging in the screening, diagnosis, staging, and treatments o
CO5	Identify DNA as a genetic material in the molecular basis of information t
CO6	Analyze biological processes at the reductionistic level.
CO7	Apply thermodynamic principles to biological systems.
CO8	Identify microorganisms..

Na

Course	After completing this course, the students will be able to:
CO1	Describe different features of Indian constitution.Power and functioning o
CO2	Identify authority to redress a problem in the profession and in the societ

Name o

Course	Up
CO1	Determine transient response of different electrical circuit, frequency res
CO2	Generate different signals in both discrete and analog form
CO3	Analyze amplitude and phase spectrum of different signals.
CO4	Verify network theorems.
CO5	Construct circuits with appropriate instruments and safety precautions.
CO5	Simulate electrical circuit experiments using suitable software.

Name

Course	Up
	At
CO1	Determine characteristics of full wave rectifier with filter and without filte
CO2	Verify function of DAC and ADC
CO3	Construct function generator using IC, R-C coupled amplifier,linear volta

CO4	Work in a team
CO5	Validate theoretical learning with practical Special Remarks: The above-m

Name

Course	Upon successful completion of the course, student will have:
CO1	Solve problems with Newton forward /backward, Lagrange's interpolatio
CO2	problems of numerical integration using Trapezoidal rule, Simpson's 1/3
CO3	rule, Weddle's rule problems to find numerical solution of a system of lin
CO4	Gauss elimination and Gauss-Seidel iterations. problems to find numerica
CO5	Ordinary differential equation by Euler's and Runga-Kutta methods.
CO6	Find appropriate numerical methods to solve engineering problems.
CO7	Use software package to solve numerical problems.

Na

Course	Up
CO1	Describe the function of different components of magnetic circuit, DC ma
CO2	Explain the principle of operation of different types of DC machines and tr
CO3	Solve numerical problems of DC machines and transformers.
CO4	Estimate the parameters and efficiency of transformer.
CO5	Determine the characteristics of DC machines
CO6	recommend methods to control output of DC machines.

Nam

Course	Up
CO1	Describe the function of different building blocks of digital electronics, ser
CO2	Explain the principle of operation of combinational and sequential digital c
CO3	Solve numerical problems of Boolean algebra, number system, combinati
CO4	Specify applications of combinational and sequential digital circuits.
CO5	Determine specifications of different digital circuits.
CO6	Design combinational and sequential digital circuits

Name of the S

Course	Up
CO1	Explain the terms accuracy, precision, resolution, speed of response, erro
CO2	Describe methods of measurement of power, energy by instruments and
CO3	Explain the principle of operation of analog meters, instrument transform
CO4	Explain the different building block, principle of operation of oscilloscope a
CO5	Solve numerical problems related to analog meters, instrument transform
CO6	Specify applications of analog and digital measuring instruments, sensors

Name o

Course	Upon successful completion of the course, student will have:

CO1	Describe the function of different components of boilers. Engines and turb
CO2	Explain the principle of operation of different types of boilers, turbines, IC
CO3	Solve numerical problems of boilers, turbines, IC engines and Gas turbine
CO4	Analyze the performance of boilers, engines and turbines.
CO5	Determine efficiency of boilers, engines and turbines.
CO6	Explain methods to control boiler, engines and turbines parameters.

Name of t

Course	Upon successful completion of the course, student will have:
CO1	1. Illustrate different aspects of human values, ethics, engineers' respons
CO2	2. Explain different principles, different theories and laws of engineering e
CO3	3. Identify different factors in the light of Engineers' responsibility toward
CO4	4. Correlate ethics of different work environment.
CO5	5. Explain the need for intellectual property rights.

Name

Course	Upon successful completion of the course, student will have:
CO1	Understand the natural environment and its relationships with human ac
CO2	Apply the fundamental knowledge of science and engineering to assess e
CO3	Develop guidelines and procedures for health and safety issues obeying th
CO4	Acquire skills for scientific problem-solving related to air, water, noise& la

Name of t

Course	Upon successful completion of the course, student will have:
CO1	Identify appropriate equipment and instruments for the experiment.
CO2	Test the instrument for application to the experiment.
CO3	Construct circuits with appropriate instruments and safety precautions
CO4	Validate different characteristics of DC machine , methods of speed contr
CO5	Work effectively in a team

Name of t

Course	Upon successful completion of the course, student will have:
CO1	Identify appropriate equipment and instruments for the experiment
CO2	2. Test the instruments for application to the experiment
CO3	3. Construct decoder , multiplexer, adder and subtractor circuits with app
CO4	4. Realize RS-JK and D flip flop, universal register with gates, multiplexer
CO5	5. Validate the operation of code conversion circuit –BCD to Excess 3 & vi
CO5	Work effectively in a team

Name of the Subjec

Course	Upon successful completion of the course, student will have:
	1. identify appropriate equipment and instruments for the experiment

	2. test the instrument for application to the experiment
	3. construct circuits with appropriate instruments and safety precautions
	4. evaluate and adjust the precision and accuracy of AC energy meter, m
	5. measure voltage, current, power, energy, phase , frequency, resistanc
	6. work effectively in a team

Name of the S

Course	Upon successful completion of the course, student will have:
CO1	Identify appropriate equipment and instruments for the experiment
CO2	Construct experimental setup with appropriate instruments and safety pr
CO3	Identify different parts of Lanchashire Boiler, Bahcock & Willcox Boiler, Co
CO4	Test 4 stroke petrol engine by electrical load box and diesel engine by ele
CO5	Find calorific value, flash point, fire point, cloud point, pour point of fuel.
C06	Work effectively in a team

Name of t

Course	On successful completion of the course the student will be able to:
	1. To understand the arrangement of windings of AC machines.
	2. To understand the principle of production of pulsating and revolving m
	3. To understand the principle of operation and characteristics of three ph
	4. To understand the principle of operation and characteristics of single p
	5. To understand the principle of operation and characteristics of synchro
	6. To understand the principle of operation and characteristics of special e
	7. To solve problems of Induction machines, synchronous machines and s

I

Course	After completion of this course the students will be able to:
CO1	To understand the basic principle of generation of Electricity from differen
CO2	To find parameters and characteristics of overhead transmission lines and
CO3	To find different parameters for the construction of overhead transmissio
CO4	To determine the performance of transmission lines.
CO5	To understand the principle tariff calculation.
CO6	To solve numerical problems on the topics studied.

N

Course	On completion of this course a student will be in a position to:
CO1	1. To find mathematical representation of LTI systems.
CO2	2. To find time response of LTI systems of different orders
CO3	3. To find the frequency response of LTI systems of different orders
CO4	4. To understand stabilityof differentLTI systems.
CO5	5. To analyze LTIsystems with state variables.
CO6	6. To solve problems of mathematical modelling and stability of LTI syste

Na

Course	On completion of this course a students will be able to
CO1	To understand the functioning and characteristics of power switching dev
CO2	To understand the principle of operation of converters.
CO3	To understand different triggering circuits and techniques of commutatior
CO4	To find external performance parameter of converters.
CO5	To analyze methods of voltage control, improvement of power factor and
CO6	To solve numerical problems of converters

Name of

Course	After completion of the course, the students will be able to:
CO1	identify appropriate equipment and instruments for the experiment.
CO2	test the instrument for application to the experiment.
CO3	construct circuits with appropriate instruments and safety precautions.
CO4	validate different characteristics of single phase Induction motor, three ph
CO5	work effectively in a team

Name c

Course	On completion of this course a students will be able to
CO1	identify appropriate equipment and instruments for the experiment.
CO2	test the instrument for application to the experiment.
CO3	3. construct circuits with appropriate instruments and safety precautions.
CO4	4. validate different characteristics of transmission line.
CO5	5. determine earth resistance, dielectric strength of insulating oil, breakd
CO6	6. analyze an electrical transmission line circuit with the help of software
CO7	7. work effectively in a team

Name c

Course	After completion of this course the students will be able to
CO1	identify appropriate equipment and instruments for the experiment.
CO2	test the instrument for application to the experiment.
CO3	construct circuits with appropriate instruments and safety precautions.
CO4	use MAT-Lab control system tool box, MAT-Lab- simulink tool box & PSPI
CO5	5. determinecontrol system specifications of first and second order syster

Name of

Course	On completion of this course a students will be able to
CO1	identify appropriate equipment and instruments for the experiment.
CO2	test the instrument for application to the experiment.
CO3	construct circuits with appropriate instruments and safety precautions

Name o

Course	On completion of this course a student will be in a position to:
CO1	differentiate how the choices of data structure & algorithm methods enha
CO2	solve problems based upon different data structure & also write programs
CO3	write programs based on different data structure
CO4	identify appropriate data structure & algorithmic methods in solving probl
CO5	discuss the computational efficiency of the principal algorithms for sortinc
CO6	comparethe benefits of dynamic and static data structures implementatio

Name of

Year: 3rd

Course	After completion of this course the students will be able to
CO1	specify simple abstract data types.
CO2	recognise features of object-oriented design such as encapsulation, polyn
CO3	inheritance, and composition of systems based on object identity.
CO4	apply common object-oriented design patterns
CO5	specify uses of common object oriented design patterns with examples.
CO6	design applications with an event-driven graphical user interface.

N

Course	After completion of the course, the students will be able to:
CO1	Represent power system components in line diagrams.
CO2	Determine the location of distribution substation.
CO3	Determine the performance of power system with the help of load flowv s
CO4	Analyse faults in Electrical systems.
CO5	Determine the stabilty of Power system.
CO6	Explain principle of operation of different power system protection equipn
CO7	Solve numerical problems related to representation, load flow, faults, stal

Name of th

Year: 3rd

Course	After completion of the course, the students will be able to
CO1	1. explain the architecture of 8086 and 8051.
CO2	2. do assembly language programming of 8086, 8051
CO3	3. interface different peripheral with 8086 and 8051
CO4	4. develop micro processor/ microcontroller based systems.
CO5	5. compare microprocessor, microcontroller, PIC and ARM processors

Nam

Course	On completion of this course a students will be able to
CO1	explain the principle of sampling and reconstrction of analog signal. syst
CO2	perform Z-transformation and inverse Z-tranaformation of systems.
CO3	analyse and design digital control
CO4	design compensators for digital control system to achieve desired specifi

CO5	represent digital control systems using state space models.
CO6	analyze the effect sampling on stability, controllability and observability

Na

Course	A
CO1	choose intelligently AC and DC transmission systems for the dedicated ap
CO2	identify the suitable two-level/multilevel configuration for high power cor
CO3	select the suitable protection method for various converter faults.
CO4	4. identify suitable reactive power compensation method.
CO5	5. decide the configuration for harmonic mitigation on both AC and DC sic
CO6	6. solve numerical problems related to converters, power flow analysis, re

Name

Course	After completion of this course the students will be able to
CO1	specify the rating of electrical machines with standard specifications.
CO2	explain the principles of electrical machine design and carry out basic des
CO3	3. determine the various factors which influence the design of electrical, r
CO4	4. explain the construction and performance characteristics of electrical m
CO5	5. use software tools to do design calculations.

Name of

Course	On completion of this course a students will be able to
CO1	explain the principle of Electric traction.
CO2	choose a suitable drive scheme for developing an electric hybrid vehicle d
CO3	design and develop basic schemes of electric vehicles and hybrid electric
CO4	choose proper energy storage systems for vehicle applications
CO5	implement different energy management strategies for hybrid vehicle.

Name

Course Outcomes	analyse uncompensated AC transmission line. explain the working principles of FACTS devices and their operating chara 3. apply FACTS devices for power flow control and stabilty. 4. identify different issues of power quality in distribution system. 5. apply different compensation and control techniques for DSTATCOM6.
Name of the Subject: INDUSTRIAL ELECTRICALSYSTEMS	
Subject Code: PE-EE-602C	
Year: 3rd	
Course Outcomes	1. Represent electrical wiring system for residential, commercial and indu 2. Determine the rating of components of residential and commercial elec 3. Design lighting scheme for a residential and commercial premises. 4. Select transformer, switchgear, protection equipments for industrial el 5. explain methods of automation of Industrial Electrical Systems 6. Solve numerical problems related to earthing system, lighting scheme,

Name of the Subject: DIGITAL SIGNALPROCESSING

Subject Code: PE-EE-601A

Year: 3rd

Course Outcomes	1. represent signals mathematically in continuous and discrete-time and i 2. analyse discrete-time systems using z-transform. 3. explain the Discrete-Fourier Transform (DFT) and the FFT algorithms. 4. design digital filters for various applications. 5. apply digital signal processing for the analysis of real-life signals.

Name of the Subject: COMMUNICATION ENGINEERING

Subject Code: PE-EE-601B

Year: 3rd

Course Outcomes	1. compare the performance of AM, FM and PM schemes with reference to 2. explain noise as a random process and its effect on communication rec 3. evaluate the performance of ASK, FSK, PSK, BPSK, QPSK in a digital co 4. identify source coding and channel coding schemes for a given commu 5. analyze various digital modulation methods 6. compute band width requirement and probability of error in various dig

Name of the Subject: VLSI AND MICROELECTRONICS

Subject Code: PE-EE-603C

Year: 3rd

Course Outcomes	1. explain the principle of design of VLSI circuits 2. explain different MOS structure with characteristics 3. apply different processes for VLSI fabrication 4. use programming language for the design of logic circuits 5. draw the stick diagram and layout for simple MOS circuits

Name of the Subject: ECONOMICS FOR ENGINEERS

Subject Code: HM-EE-601

Year: 3rd

Course Outcomes	1. evaluate the economic theories, cost concepts and pricing policies 2. explain the market structures and integration concepts 3. apply the concepts of financial management for project appraisal 4. explain accounting systems , the impact of inflation, taxation, depreciа 5. analyze financial statements using ratio analysis 6. explain financial planning, economic basis for replacement, project sch

Name of the Subject: POWER SYSTEM-II LABORATORY

Subject Code: PC-EE 691

Year: 3rd

Course Outcomes	1. Identify appropriate equipment and instruments for the experiment. 2. Test the instrument for application to the experiment. 3. Construct circuits with appropriate instruments and safety precautions 4. Validate the characteristics of under voltage relay, over current relay, (5. Validate protection schemes of transformer, generator, motor and feed 7. work effectively in a team

Name of the Subject: MICRO PROCESSOR AND MICRO CONTROLLERLABORATORY

Subject Code: : PC-EE 692

Year: 3rd

Course	1. identify appropriate equipment and instruments for the experiment

Outcomes	2. test the instrument for application to the experiment 3. construct circuits with appropriate instruments and safety precautions 4. program 8086 for arithmatic operation, sorting of array, searching for 5. interface ADC/DAC, 8255, 8251 to 8086 and LCD, keyboard to 8051 6. program 8051 using arithmatic, logical and bit manipulation instructior 7. work effectively in a team

Name of the Subject: ELECTRICAL AND ELECTRONICS DESIGNLABORATORY

Subject Code: PC-EE 681

Year: 3rd

Course Outcomes	1. explain basic concept of measurement, noise in electronic system, sens 2. implement PC based data acquisition systems 3. construct circuits with appropriate instruments and safety precautions 4. design heating elements, air core grounding reactor, power distributior 5. do wiring and installation design of a multistoried residential building w 6. design electronic hardware for controller of lift, speed of AC/DC motor,

Name of the Subject: ELECTRIC DRIVE

Subject Code: PC-EE 701

Year: 4TH

Course Outcomes	1. Explain the principle of operation of Electric Drive. 2. Describe different methods of starting and braking of Electric Drive. 3. Model and control DC Drive 4. Control speed of Induction and Synchronous motors. 5. Recommend drives for different applications. 6. Estimate ratings, variables and parameters of Electric Drives.

Name of the Subject: CONTROL SYSTEM DESIGN

Subject Code: PE-EE 701 A

Year: 4TH

Course Outcomes	1. explain the effect of gain, addition of pole and zeros on system's perfor 2. describe time domain and frequency domain design specifications. 3. demonstrate the effect of nonlinearity on system performance. 4. design control system in time domain , in frequency domain and in sta 5. design PID controllers. 6. select appropriate method for design of control system.

Name of the Subject: ELECTRICAL ENERGY CONSERVATION& AUDITING

Subject Code: : PE-EE 701B

Year: 4TH

Course Outcomes	1. explain the basic of energy resources, energy security, energy conserv 2. quantify the energy conservation opportunities in different thermal sys 3. quantify the energy conservation opportunities in different electrical sy 4. identify the common energy conservation opportunities in different ene 5. explain the methods of energy management and audit. 6. analyse and report the outcome of energy audit

Name of the Subject: POWER GENERATION ECONOMICS

Subject Code: : PE-EE 701C

Year: 4TH

Course	1. explain the different terms e.g. load factor etc for economics of genera

Outcomes	2. apply different types of tariff for electricity pricing. 3. optimize the operation of power system with unit commitment. 4. determine generation levels such that the total cost of generation beco 5. determine the state of the system given by the voltage magnitudes an 6. predict the power or energy needed to balance the supply and load de

Name of the Subject: ARTIFICIAL INTELLIGENCE

Subject Code: OE-EE-701A

Year: 4TH

Course Outcomes	1. explain the concept of knowledge representation and predicate logic ar 2. describe state space and its searching strategies 3. demonstrate profciency in applying scientifc method to models of mach 4. apply the machine learning concepts in real life problems 5. demonstrate an ability to share in discussions of AI, its current scope a

Name of the Subject: INTERNET OF THINGS

Subject Code: OE-EE-701B

Year:4TH

Course Outcomes	1. explain the definition and usage of the term "Internet of Things" in diff 2. explain the key components that make up an IoT system. 3. differentiate between the levels of the IoT stack and be familiar with t 4. build and test a IoT system involving prototyping, programming and da 5. apply cloud computing and data analytics in a typical IoT system

Name of the Subject: COMPUTER GRAPHICS

Subject Code: OE-EE-701C

Year: 4TH

Course Outcomes	1. explain Computer graphics and graphic systems. 2. test and implement line drawing algorithm, circle and ellipse drawing a 3. Perform 2D and 3D transformation and viewing. 4. apply algorithms for visible surface determination. 5. explain colors and shading models and ray tracing.

Name of the Subject: EMBEDDED SYSTEM

Subject Code: OE-EE 702A

Year: 4TH

Course Outcomes	1. discuss the definition, purpose, application, classification , quality char 2. explain the internal structure of the Embedded system. 3. interface IO devices and other peripherals with micro controllers in Em 4. write programs for Micro controllers in Embedded systems. 5. apply the concept of Embedded firmware in design of Embedded syste

Name of the Subject: DIGITAL IMAGE PROCESSING

Subject Code: OE-EE 702B

Year: 4TH

Course Outcomes	1. explain the fundamental concepts of a digital image processing system 3. apply different image segmentation techniques. 4. categorize various compression techniques. 5. implement image process and analysis algorithms. 6. apply image processing algorithms in practical applications.

Name of the Subject: COMPUTER NETWORK

Subject Code: : OE-EE 702C

Year: 4TH

Course Outcomes	1. explain the concepts of data communication and networking. 2. identify the different types of network topologies and protocols. 3. describe the function of a network system with OSI and TCP/IP model. 4. differentiate different types of routing protocol. 5. apply principles of congestion control . 6. implement different schemes for security of the networks.

Name of the Subject: PRINCIPLE OF MANAGEMEENT

Subject Code: : HM-EE 701

Year: 4TH

Course Outcomes	1. explain the concepts and approaches of management. 2. demonstrate the roles, skills and functions of management. 3. diagnose and solve organizational problems. 4. identify the complexities associated with management of human resou 5. apply different methods of Customer, Operation and Technology mana 6. acquire skills of good leader in an organization.

Name of the Subject: ELECTRIC DRIVE LABORATORY

Subject Code: PC-EE 791

Year: 4TH

Course Outcomes	1. identify appropriate equipment and instruments for the experiment. 2. test the instrument for application to the experiment. 3. construct circuits with appropriate instruments and safety precautions. 4. apply different methods of control of Electric Drive in the laboratory. 5. analyse experimental data obtained in the laboratory. 6. work effectively in a team

Name of the Subject: UTILIZATION OF ELECTRIC POWER

Subject Code: : PC-EE 801

Year: 4TH

Course Outcomes	1. explain the fundamentals of illumination and different lighting schemes 3. able to select appropriate lighting, heating and welding techniques for 4. apply different electrolysis process for different applications. 5. explain the principle of different aspect of Electric traction and control

Name of the Subject: LINE COMMUTATED AND ACTIVE PWM RECTIFIERS

Subject Code: PE-EE 801A

Year: 4TH

Course Outcomes	1. explain the principle of operation of different converters. 2. suggest the application of different filters. 3. apply converters for different applications. 4. analyze converter circuits. 5. develop appropriate scheme for control of different converters. 6. solve numerical problems relating to different converters.

Name of the Subject: POWER SYSTEM DYNAMICS AND CONTROL

Subject Code: PE-EE 801B

Year: 4TH

Course Outcomes	1. explain the model of power system components 2. select the appropriate model for required analysis. 3. analyze the performance of the system with small signal analysis.

	4. evaluate the stability of the single and multi machine systems. 5. develop measures for enhancing the stability of the system. 6. Solve numerical problems of linear dynamical system, modeling of diffe
Name of the Subject: ADVANCED ELECTRIC DRIVE	
Subject Code: PE-EE 801C	
Year: 4TH	
Course Outcomes	1. explain the principle of operation of converters for AC drives. 2. model Induction and Synchronous motor by reference frame theory. 3. apply different control methods to control speed and torque of Inductic 4. explain the configurations and method of speed control of BLDC, PMSM 5. realize basic blocks for DSP based motion control. 6. develop appropriate scheme for speed control of Induction and Synchr
Name of the Subject: INDUSTRIAL AUTOMATION AND CONTROL	
Subject Code: : PE-EE 801D	
Year: 4TH	
Course Outcomes	1. explain the basic structure of industrial automation and control 2. classify different types of control actions of controllers. 3. analyze control strategies of different processes of industry. 4. illustrate the construction and use of different types of actuators and c 5. use PLC, DCS and SCADA in advanced industrial control.
Name of the Subject: SOFT COMPUTING TECHNIQUES	
Subject Code: OE-EE 801A	
Year: 4TH	
Course Outcomes	1. explain soft computing techniques and their roles in building intelligent 2. anlyse the feasibility of application of soft computing techniques for a p 3. effectively use existing software tools to solve real problems using a sc 4. evaluate solutions by various soft computing approaches for a given pr 5. apply different soft computing techniques to solve Engineering problem
Name of the Subject: BIOMEDICAL INSTRUMENTATION	
Subject Code: OE-EE 801B	
Year: 4TH	
Course Outcomes	1. describe the principle of medical transducers for temperature, pressure 2. explain the principle of operation of Biomedical recorders, Medical Ima 3. use different Medical laboratory equipments for different tests . 4. analyze any measurement application and suggest suitable measurem 5. suggest suitable imaging methodology for a specific ailment.
Name of the Subject: INTRODUCTION TO MACHINE LEARNING	
Subject Code: OE-EE 801C	
Year: 4TH	
Course Outcomes	1. explain the basics concepts and classification of Machine Learning . 2. write simple programs using python. 3. describe Supervised Learning concepts. 4. explain the concept of Support Vector Machine. 5. describe unsupervised learning concepts and dimensionality reduction 6. apply Machine Learning in a range of real-world applications .
Name of the Subject: SENSORS AND TRANSDUCERS	
Subject Code: OE-EE 801D	

Year: 4TH

Course Outcomes	1. explain the basic principle of operation of Transducers and Sensors. 2. distinguish different sensors and transducers. 3. identify suitable transducer by comparing different industrial standards 4. estimate the performance of different transducers. 5. design real life electronics and instrumentation measurement systems

PROGRAMME OUTCOMES (PO) BASED ON G.A.

		PO1	PO2	PO3	PO4
Course Outcomes	CO1	0.67	0.67	0.67	0.67
	CO2	0.67	0.67	0.67	0.67
	CO3	0.67	0.67	0.67	
	CO4	0.67	0.67	0.67	0.67
	CO5	0.67	0.67	0.67	
	CO6	0.67	0.67	0.67	0.67
Course Outcomes	CO1	0.66	0.66	0.66	0.66
	CO2	0.66	0.66	0.66	0.66
	CO3	0.66	0.66	0.66	
	CO4	0.66	0.66	0.66	0.66
	CO5	0.66	0.66	0.66	
	CO1	0.74	0.74	0.74	0.74
Course Outcomes	CO2	0.74	0.74	0.74	0.74
	CO3	0.74	0.74	0.74	0.74
	CO4	0.74	0.74	0.74	0.74
	CO5	0.74	0.74	0.74	0.74
	CO6	0.74	0.74	0.74	0.74

	CO1	0.77	0.77	0.77	0.77
Course Outcomes	CO2	0.77	0.77	0.77	0.77
	CO3	0.77	0.77	0.77	0.77
	CO4	0.77	0.77	0.77	0.77
	CO5	0.77	0.77	0.77	0.77
	CO1	0.78	0.78		0.78
	CO2	0.78	0.78		0.78
Course Outcomes	CO3	0.78	0.78		0.78
	CO4	0.78	0.78		0.78
	CO5	0.78	0.78		0.78
	CO6	0.78	0.78		0.78
	CO1	0.75			
	CO2	0.75			0.75
Course Outcomes	CO3	0.75			0.75
	CO4	0.75			0.75
	CO5	0.75			0.75
	CO6	0.75			0.75
	CO1	0.92			
	CO2				
Course Outcomes	CO1	0.9	0.9	0.9	0.9
	CO2	0.9	0.9	0.9	0.9
	CO3	0.9	0.9	0.9	
	CO4	0.9	0.9	0.9	0.9
	CO5	0.9	0.9	0.9	
	CO6	0.9	0.9	0.9	0.9
Course Outcomes	CO1	0.89	0.89	0.89	0.89
	CO2	0.89	0.89	0.89	0.89
	CO3	0.89	0.89	0.89	
	CO4	0.89	0.89	0.89	0.89
	CO5	0.89	0.89	0.89	
	CO1	0.84	0.84		0.84
Course Outcomes	CO2	0.84	0.84		0.84
	CO3	0.84	0.84		0.84
	CO4	0.84	0.84		0.84
	CO5	0.84	0.84		0.84
	CO6	0.84	0.84		0.84
	CO1	0.87	0.87	0.87	0.87
Course Outcomes	CO2	0.87	0.87	0.87	0.87
	CO3	0.87	0.87		
	CO4	0.87	0.87		
	CO5	0.87	0.87		
	CO6	0.87	0.87	0.87	0.87
	CO1	0.76	0.76	0.76	0.76
Course Outcomes	CO2	0.76	0.76	0.76	0.76
	CO3	0.76	0.76	0.76	
	CO4	0.76	0.76	0.76	
	CO5	0.76	0.76	0.76	0.76

	CO6	0.76	0.76	0.76	0.76
	CO1	0.72	0.72	0.72	0.72
Course Outcomes	CO2	0.72	0.72	0.72	
	CO3	0.72	0.72	0.72	
	CO4	0.72			
	CO5	0.72			0.72
	CO6	0.72	0.72	0.72	
	CO1	0.71	0.71	0.71	0.71
Course Outcomes	CO2	0.71	0.71		
	CO3	0.71	0.71	0.71	
	CO4	0.71			
	CO5	0.71			0.71
	CO6	0.71	0.71	0.71	0.71
	CO1	0.88	0.88	0.88	0.88
Course Outcomes	CO2	0.88	0.88	0.88	
	CO3	0.88	0.88	0.88	
	CO4	0.88			
	CO5	0.88			0.88
	CO6	0.88	0.88	0.88	0.88
	CO1	0.95	0.95	0.95	0.95
Course Outcomes	CO2	0.95	0.95	0.95	
	CO3	0.95	0.95	0.95	
	CO4	0.95			
	CO5	0.95			0.95
	CO6	0.95	0.95	0.95	0.95
	CO1	0.76	0.76	0.76	0.76
Course Outcomes	CO2	0.76	0.76		
	CO3	0.76	0.76	0.76	
	CO4	0.76			
	CO5	0.76			0.76
	CO6	0.76	0.76	0.76	0.76
	CO1	0.92	0.92	0.92	0.92
Course Outcomes	CO2	0.92	0.92	0.92	
	CO3	0.92	0.92	0.92	
	CO4	0.92			
	CO5	0.92			0.92
	CO6	0.92	0.92	0.92	0.92
	CO1	0.91	0.91	0.91	0.91
Course Outcomes	CO2	0.91	0.91	0.91	
	CO3	0.91	0.91	0.91	
	CO4	0.91			
	CO5	0.91			0.91
	CO6	0.91	0.91	0.91	0.91
	CO1	0.87	0.87	0.87	0.87
Course Outcomes	CO2	0.87	0.87	0.87	
	CO3	0.87	0.87	0.87	
	CO4	0.87			

	CO5	0.87			0.87
	CO6	0.87	0.87	0.87	0.87
	CO1	0.67	0.67	0.67	
Course Outcomes	CO2	0.67			0.67
	CO3	0.67			0.67
	CO4				0.67
	CO5		0.67	0.67	
	CO6	0.67	0.67	0.67	
	CO1	0.84	0.84	0.84	
Course Outcomes	CO2	0.84			0.84
	CO3	0.84			0.84
	CO4				0.84
	CO5		0.84	0.84	
	CO6	0.84	0.84	0.84	
	CO1	0.71	0.71	0.71	
Course Outcomes	CO2	0.71			0.71
	CO3	0.71			0.71
	CO4				0.71
	CO5		0.71	0.71	
	CO6	0.71	0.71	0.71	
	CO1	0.92	0.92	0.92	
Course Outcomes	CO2	0.92			0.92
	CO3	0.92			0.92
	CO4				0.92
	CO5		0.92	0.92	
	CO6	0.92	0.92	0.92	
	CO1	0.63	0.63	0.63	
Course Outcomes	CO2	0.63			0.63
	CO3	0.63			0.63
	CO4				0.63
	CO5		0.63	0.63	
	CO6	0.63	0.63	0.63	
	CO1	0.87	0.87	0.87	
Course Outcomes	CO2	0.87			0.87
	CO3	0.87			0.87
	CO4				0.87
	CO5		0.87	0.87	
	CO6	0.87	0.87	0.87	
	CO1	0.68	0.68	0.68	
Course Outcomes	CO2	0.68			
	CO3	0.68			
	CO4				
	CO5		0.68	0.68	
	CO6	0.68	0.68	0.68	
	CO1	0.83	0.83	0.83	
Course Outcomes	CO2	0.83			
	CO3	0.83			

	CO4				
	CO5		0.83	0.83	
	CO6	0.83	0.83	0.83	
	CO1	NA	NA	NA	NA
Course Outcomes	CO2	NA	NA	NA	NA
	CO3	NA	NA	NA	NA
	CO4	NA	NA	NA	NA
	CO5	NA	NA	NA	NA
	CO6	NA	NA	NA	NA
	CO1		0.83	0.83	0.83
Course Outcomes	CO2	0.83	0.83		
	CO3	0.83	0.83		
	CO4	0.83			
	CO5	0.83		0.83	0.83
	CO6	0.83	0.83	0.83	0.83
	CO1	0.71	0.71	0.71	0.71
Course Outcomes	CO2	0.71	0.71		
	CO3	0.71	0.71		
	CO4	0.71			
	CO5	0.71		0.71	0.71
	CO6	0.71	0.71	0.71	0.71
	CO1	0.68	0.68	0.68	0.68
Course Outcomes	CO2	0.68	0.68		
	CO3	0.68	0.68		
	CO4	0.68			
	CO5	0.68		0.68	0.68
	CO6	0.68	0.68	0.68	0.68
	CO1	NA	NA	NA	NA
Course Outcomes	CO2	NA	NA	NA	NA
	CO3	NA	NA	NA	NA
	CO4	NA	NA	NA	NA
	CO5	NA	NA	NA	NA
	CO6	NA	NA	NA	NA
	CO1	0.73	0.73	0.73	0.73
Course Outcomes	CO2	0.73	0.73		
	CO3	0.73	0.73		
	CO4	0.73			
	CO5	0.73		0.73	0.73
	CO6	0.73	0.73	0.73	0.73
	CO1	0.89	0.89	0.89	0.89
Course Outcomes	CO2	0.89	0.89		
	CO3	0.89	0.89		
	CO4	0.89			
	CO5	0.89		0.89	0.89
	CO6	0.89	0.89	0.89	0.89
	CO1	0.65	0.65	0.65	0.65
Course	CO2	0.65	0.65		

Outcomes	CO3	0.65	0.65		
	CO4	0.65	0.65		
	CO5	0.65	0.65	0.65	0.65
	CO6	0.65	0.65	0.65	0.65
	CO1	0.89	0.89	0.89	0.89
Course Outcomes	CO2	0.89	0.89		
	CO3	0.89	0.89		
	CO4	0.89	0.89		
	CO5	0.89	0.89	0.89	0.89
	CO6	0.89	0.89	0.89	0.89
	CO1	0.92	0.92	0.92	0.92
Course Outcomes	CO2	0.92	0.92		
	CO3	0.92	0.92		
	CO4	0.92	0.92		
	CO5	0.92	0.92	0.92	0.92
	CO6	0.92	0.92	0.92	0.92
	CO1	0.68	0.68	0.68	0.68
Course Outcomes	CO2	0.68			0.68
	CO3	0.68			0.68
	CO4	0.68			0.68
	CO5	0.68	0.68	0.68	0.68
	CO6	0.68	0.68	0.68	0.68
	CO1	NA	NA	NA	NA
Course Outcomes	CO2	NA	NA	NA	NA
	CO3	NA	NA	NA	NA
	CO4	NA	NA	NA	NA
	CO5	NA	NA	NA	NA
	CO6	NA	NA	NA	NA
	CO1	NA	NA	NA	NA
Course Outcomes	CO2	NA	NA	NA	NA
	CO3	NA	NA	NA	NA
	CO4	NA	NA	NA	NA
	CO5	NA	NA	NA	NA
	CO6	NA	NA	NA	NA
	CO1	0.9	0.9	0.9	0.9
Course Outcomes	CO2	0.9	0.9	0.9	0.9
	CO3	0.9	0.9		
	CO4	0.9	0.9		
	CO5	0.9	0.9	0.9	0.9
	CO6	0.9	0.9	0.9	0.9
	CO1	NA	NA	NA	NA
Course Outcomes	CO2	NA	NA	NA	NA
	CO3	NA	NA	NA	NA
	CO4	NA	NA	NA	NA
	CO5	NA	NA	NA	NA
	CO6	NA	NA	NA	NA
	CO1	0.87	0.87	0.87	0.87

Course Outcomes	CO2	0.87	0.87	0.87	0.87
	CO3	0.87			0.87
	CO4	0.87	0.87	0.87	0.87
	CO5	0.87			
	CO6	0.87	0.87	0.87	0.87
	CO1	0.86	0.86	0.86	0.86
Course Outcomes	CO2	0.86	0.86	0.86	0.86
	CO3	0.86	0.86	0.86	0.86
	CO4	0.86	0.86		0.86
	CO5	0.86	0.86		0.86
	CO6	0.86	0.86		0.86
	CO1	0.83	0.83	0.83	0.83
Course Outcomes	CO2	0.83	0.83		
	CO3	0.83			
	CO4	0.83	0.83	0.83	0.83
	CO5	0.83	0.83	0.83	
	CO6	0.83	0.83	0.83	
	CO1	0.92	0.92	0.92	0.92
Course Outcomes	CO2	0.92	0.92		
	CO3	0.92			
	CO4	0.92	0.92	0.92	0.92
	CO5	0.92	0.92	0.92	
	CO6	0.92	0.92	0.92	
	CO1	NA	NA	NA	NA
Course Outcomes	CO2	NA	NA	NA	NA
	CO3	NA	NA	NA	NA
	CO4	NA	NA	NA	NA
	CO5	NA	NA	NA	NA
	CO6	NA	NA	NA	NA
	CO1	NA	NA	NA	NA
Course Outcomes	CO2	NA	NA	NA	NA
	CO3	NA	NA	NA	NA
	CO4	NA	NA	NA	NA
	CO5	NA	NA	NA	NA
	CO6	NA	NA	NA	NA
	CO1	0.82	0.82	0.82	
Course Outcomes	CO2	0.82	0.82	0.82	
	CO3	0.82	0.82	0.82	
	CO4	0.82	0.82	0.82	
	CO5	0.82	0.82	0.82	
	CO6	0.82	0.82	0.82	
	CO1	0.84	0.84	0.84	0.84
Course Outcomes	CO2	0.84	0.84	0.84	0.84
	CO3	0.84			
	CO4	0.84			
	CO5	0.84	0.84	0.84	0.84
	CO6	0.84	0.84	0.84	0.84

	CO1	NA	NA	NA	NA
Course Outcomes	CO2	NA	NA	NA	NA
	CO3	NA	NA	NA	NA
	CO4	NA	NA	NA	NA
	CO5	NA	NA	NA	NA
	CO6	NA	NA	NA	NA
	CO1	NA	NA	NA	NA
Course Outcomes	CO2	NA	NA	NA	NA
	CO3	NA	NA	NA	NA
	CO4	NA	NA	NA	NA
	CO5	NA	NA	NA	NA
	CO6	NA	NA	NA	NA
	CO1	NA	NA	NA	NA
Course Outcomes	CO2	NA	NA	NA	NA
	CO3	NA	NA	NA	NA
	CO4	NA	NA	NA	NA
	CO5	NA	NA	NA	NA
	CO6	NA	NA	NA	NA
	CO1	NA	NA	NA	NA
Course Outcomes	CO2	NA	NA	NA	NA
	CO3	NA	NA	NA	NA
	CO4	NA	NA	NA	NA
	CO5	NA	NA	NA	NA
	CO6	NA	NA	NA	NA
	CO1	0.82	0.82		
Course Outcomes	CO2	0.82	0.82	0.82	
	CO3	0.82	0.82	0.82	
	CO4	0.82	0.82	0.82	
	CO5	0.82	0.82	0.82	0.82
	CO6	0.82	0.82	0.82	0.82
	CO1	0.86	0.86		
Course Outcomes	CO2	0.86	0.86		
	CO3	0.86	0.86		
	CO4	0.86	0.86		
	CO5	0.86	0.86		
	CO6	0.86	0.86		
	CO1	0.91	0.91	0.91	0.91
Course Outcomes	CO2	0.91	0.91	0.91	0.91
	CO3	0.91	0.91	0.91	0.91
	CO4	0.91	0.91	0.91	0.91
	CO5	0.91	0.91	0.91	
	CO6	0.91	0.91	0.91	0.91
	CO1	0.92	0.92	0.92	0.92
Course Outcomes	CO2	0.92	0.92	0.92	0.92
	CO3	0.92	0.92	0.92	0.92
	CO4	0.92	0.92	0.92	0.92
	CO5	0.92	0.92	0.92	0.92

	CO6	0.92	0.92	0.92	0.92
	CO1	0.86	0.86		
Course Outcomes	CO2	0.86	0.86		
	CO3	0.86	0.86		
	CO4	0.86	0.86		
	CO5	0.86	0.86		
	CO6	0.86	0.86		
	CO1	0.87	0.87	0.87	0.87
Course Outcomes	CO2	0.87	0.87	0.87	0.87
	CO3	0.87	0.87	0.87	0.87
	CO4	0.87	0.87	0.87	0.87
	CO5	0.87	0.87	0.87	0.87
	CO6	0.87	0.87	0.87	0.87
	CO1	0.85	0.85		
Course Outcomes	CO2	0.85	0.85		0.85
	CO3	0.85	0.85		
	CO4	0.85	0.85		0.85
	CO5	0.85	0.85		0.85
	CO6	0.85	0.85		0.85
	CO1	0.94	0.94	0.94	0.94
Course Outcomes	CO2	0.94	0.94	0.94	0.94
	CO3	0.94	0.94	0.94	0.94
	CO4	0.94	0.94	0.94	0.94
	CO5	0.94	0.94	0.94	0.94
	CO6	0.94	0.94	0.94	0.94
	AVERAGE	0.818013937	0.822268908	0.819392265	0.81755814
	PERCENTAGE (%)	81	82	81	81

Apply the knowledge of mathematics, science,
nentals, and an engineering specialisation for the solution of complex engineering problem

ng first principles of mathematics, natural sciences, and engineering sciences.

gn system components or processes that meet the specified needs with appropriate consid
ental considerations.

ding design of experiments, analysis and
ide valid conclusions.

and modern engineering and IT tools, including prediction and modelling to complex engin

ess societal, health, safety, legal, and cultural issues and the consequent responsibilities

ns in societal and environmental contexts, and demonstrate the knowledge of, and need fo

d responsibilities and norms of the engineering practice.

der in diverse teams, and in multidisciplinary settings.

th the engineering community and with t h e society at large, such as, being able to compr
ive presentations, and give and receive clear instructions.

ing and management principles and apply these to one's own work, as a member and lead

y to engage in independent and life-long learning in the broadest context of technological c

l
olve real

lated to
urces, high

ory
ves,

ɔn and
' of

ıgineering

ıg a

e of the Subject: ELECTRIC CIRCUIT THEORY
Subject Code: : PC-EE 301
Year: 2nd (New Syllabus)

of networks.

me of the Subject: ANALOG ELECTRONICS
Subject Code: PC-EE 302
Year: 2nd (New Syllabus)

regulators and analog electronic circuits.

ɛd on application.

the Subject: ELECTRO MAGNETIC FIELD THEORY
Subject Code: PC-EE 303
Year: 2nd (New Syllabus)

ıetic problems.

e of the Subject: ENGINEERING MECHANICS
Subject Code: ES-ME 301
Year: 2nd (New Syllabus)

ıematics and kinetics of rigid bodies.
ɔn and friction.

riction and rigid bodies.

Name of the Subject: MATHEMATICS-III
Subject Code: BS- M 301
Year: 2nd (New Syllabus)

Z transform

sis and Z transform

e of the Subject: BIOLOGY FOR ENGINEERS
Subject Code: BS-EE- 301
Year: 2nd (New Syllabus)

ries.

of cancer.
transfer

me of the Subject: INDIAN CONSTITUTION
Subject Code: : MC-EE 301
Year: 2nd (New Syllabus)

f Union, state and local self-government.Structure, jurisdiction and function of Indian
y.

f the Subject: : Electric circuit theory Laboratory
Subject Code: PC-EE391
Year: 2nd (New Syllabus)

on successful completion of the course, student will have:
ponse of filters, Laplace transform and inverse Laplace transform

of the Subject: : Analog Electronic laboratory
Subject Code: PC-EE392
Year: 2nd (New Syllabus)

on successful completion of the course, student will have:
fter completion of this course, the learners will be able to
r (A)characteristics of BJT and FET,(B)characteristics of Zener diode as voltage regula

ge regulator using regulator IC chip.timer circuit using 555 for monostable, astable an

hentioned outcomes are not limited. Institute may redefine outcomes based their progr

of the Subject: : Numerical Methods laboratory

Subject Code: PC-CS 391

Year: 2nd (New Syllabus)

n

ear equations using

al solution of Algebraic Equation by Regularfalsi and Newton Raphson methods.

me of the Subject: : ELECTRIC MACHINE-I

Subject Code: PC-EE-401

Year: 2nd (New Syllabus)

on successful completion of the course, student will have:

chines and transformers

ransformers

ne of the Subject: : DIGITAL ELECTRONICS

Subject Code: PC-EE-402

Year: 2nd (New Syllabus)

on successful completion of the course, student will have:

niconductor memories and programmable logic devices.

circuits, A/D and D/A converter

onal & sequential digital circuits and A/D and D/A converter.

ubject: : ELECTRICAL & ELECTRONICS MEASUREMENTS

Subject Code: PC-EE-403

Year: 2nd (New Syllabus)

on successful completion of the course, student will have:

rs in measurement, loading effect

resistance, capacitance and inductance by bridges and potentiometer

er, digital multimeter, digital voltmeter, digital frequency meter, signal generator, stra

and measurement techniques of voltage, current, frequency and phase by oscilloscope

ner, measurement of power, energy, resistance, inductance and capacitance

and transducers

f the Subject: : THERMAL POWER ENGINEERING

Subject Code: ES-EE-401

Year: 2nd (New Syllabus)

ɔines
engines and Gas turbines.
es.

he Subject: : VALUES AND ETHICS IN PROFESSION
Subject Code: HM-EE-401
Year: 2nd (New Syllabus)

ibility and duties
ethics and social experimentation
s safety and risk

e of the Subject: : ENVIRONMEMTAL SCIENCE
Subject Code: MC-EE-401
Year: 2nd (New Syllabus)

tivities
environmental and health risk
he environmental laws and regulations
nd pollution.

the Subject: : ELECTRIC MACHINE-I LABORATORY
Subject Code: PC-EE491
Year: 2nd (New Syllabus)

ol of DC motor and parallel operation of the transformer

he Subject: : DIGITAL ELECTRONICS LABORATORY
Subject Code: PC-EE492
Year: 2nd (New Syllabus)

ɔropriate instruments and precaution
and flip-flops and asynchronous and synchronous up down counters
ice versa, 4 bit parity generator & comparator circuits,

t: : ELECTRICAL & ELECTRONICS MEASUREMENT LABORATORY
Subject Code: PC-EE493
Year: 2nd (New Syllabus)

oving iron and dynamometer type ammeter, voltmeter and wattmeter by potentiomet
e, inductance, capacitance

Subject: : THERMAL POWER ENGINEEING LABORATORY
Subject Code: ES-ME-491
Year: 2nd (New Syllabus)

ecautions
ochran Boiler, Vertical Tubular Boiler, Locomotive Boiler, 4S Diesel Engine, 4S Petrol En
ctrical load box and rope brake dynamometer

he Subject: ELECTRIC MACHINE-II PC-EE-501
Subject Code: PC-EE-501
Year: 3rd

agnetic fields.
hase Induction machines
hase Induction machines
nous machine
electromechanical devices.
special eletromechanical device.

Name of the Subject: POWER SYSTEM-I
Subject Code: : PC-EE-502
Year: 3rd (Old Syllabus)

nt sources
d cables.
n line

Name of the Subject: CONTROL SYSTEM
Subject Code: PC-EE-503
Year: 3rd

ms

me of the Subject: POWER ELECTRONICS

Subject Code: PC-EE-504
Year: 3rd

ices.

n of SCR

reduction of harmonics of the converter

the Subject: ELECTRIC MACHINE-IILABORATORY
Subject Code: : PC-EE 591
Year: 3rd

hase Inductionmotor, Induction generator and synchronous motor , methods of speed

of the Subject: POWER SYSTEM-I LABORATORY
Subject Code: PC-EE 592
Year: 3rd

own strength of solidinsulating material and dielectric constant of transformer oil.

of the Subject: CONTROL SYSTEMLABORATORY

Subject Code: PC-EE 593
Year: 3rd

ICE for simulation of systems.
ns.

the Subject: POWER ELECTRONICSLABORATORY
Subject Code: PC-EE 594
Year: 3rd

of the Subject: DATA STRUCTURE & ALGORITHM

Subject Code: OE-EE-501A
Year: 3rd

nce the performanceof the program.
s.

lem.
g, searching, and hashing
ns.
the Subject: OBJECT ORIENTED PROGRAMMING
Subject Code: OE-EE-501B

norphism,

Name of the Subject: POWER SYSTEM-II
Subject Code: PC-EE-601
Year: 3rd

studies.

ments.
bilty and protection ofpower system.
e Subject: MICROPROCESSOR & MICROCONTROLLER
Subject Code: PC-EE-602

e of the Subject: DIGITAL CONTROL SYSTEM
Subject Code: PE-EE-601A
Year: 3rd

tems.

cations.

ıme of the Subject: HVDC TRANSMISSION
Subject Code: PE-EE-601B
Year: 3rd

fter completion of this course the students will be able to
pplication(s).
ıverters.

des.
eactive power control.nts.

of the Subject: ELECTRICAL MACHINE DESIGN
Subject Code: PE-EE-601C
Year: 3rd

ign of an ac machine
magnetic and thermalloading of electrical machines
nachines.

the Subject: ELECTRICAL AND HYBRID VEHICLE
Subject Code: PE-EE-602A
Year: 3rd

lepending on resources.
vehicles.

e of the Subject: POWER QUALITYANDFACTS
Subject Code: PE-EE-602B
Year: 3rd

ıcteristics.

explain working principle of dynamic voltage restorer and UPQC

ıstrial consumers.
:trical systems.

ectrical systems.

power factor correction.

in the frequencydomain.

o SNR
eivers
ommunication system
nication link

gital modulation systems

ıtion

eduling, legal andregulatory issues applied to economic investment and project-mana

.
earth fault relay, on loadtime delay relay, off load time delay relay, CT and PT.
der. 6. Apply software tools to find bus voltage, currents and power flows throughout t

a number in a string andstring manipulation

ns of 8051

sor and signal conditioning circuits

;
n system for small township, double circuit transmission line and Electric machines
with lift and pump
and for an applicationwith analog, digital, mixed signal, microcontroller and PCB

rmance.

te space.

ation and pollution.
tems
stems
ergy intensive industrialequipments

ition.

›mes minimum for a definedlevel of load.
d phase angles at all buses.
mand at all the times.

nd transform the real lifeinformation in different representation

nine learning

and limitations, and societalimplications

erent contexts

he key technologies andprotocols employed at each layer of the stack
ata analysis

lgorithm, areafilling algorithms.

acteristics and attributesof Embedded Systems

bedded systems.

ms. 6. design RTOS based Embedded systems.

. 2. enhance images in the spatial and frequency domain using various transforms.

rces in the organizationsand integrate the learning in handling these complexities.
gement.

s. 2. explain the fundamental of Electrolytic processes, Electric heating and Welding.
specific applications.

of traction motor.

erent components and stability.

on and Synchronous motor.
1 and SRM.

onous motor.

ontrol valves.

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roblem.
ns.

e and respiration rate.
ging equipments Surgical & Therapeutic Instruments and Medical Laboratory Instrume

nent methods.

techniques.

s and procedures for measurement of physical parameters

. 6. apply smart sensors, bio-sensors, PLC and Internet of Things to different applicati

PO5	PO6	PO7	PO8	PO9	PO10
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ECE PO Attainment

2021 Odd and 2022 Even Semester

PO OF ECE DEPARTMENT

PO-1: Engineering Knowledge:

Our graduates would **apply knowledge of mathematics and fundamental engineering sciences** appropriate to electronics and communication engineering to solve problem of electronics and communication engineering and related fields.

PO-2: Problem Analysis:

Our graduates would demonstrate **ability to identify formulate, research literature and analyze complex problems** of electronics and communication engineering and related areas reaching substantiated conclusions using first principle of engineering sciences.

PO-3: Design/development of solutions:

Our graduates would have **ability to design solution for complex** electronics and communication engineering problems and design system components and processes that meet the specified needs with appropriate consideration for public health and safety.

PO-4: Conduct investigations of complex problems:

Our graduates would depict **ability to use research based knowledge and research methods including design of experiments analysis and interpretation of** data and synthesis of information related to electronics and communication engineering and related areas to provide valid conclusions.

PO-5: Modern tool usage:

Our graduates would depict **ability to create, select and apply appropriate techniques and resources and modern engineering and IT tools including prediction** and modelling tool to complex electronics and communication engineering activities with an understanding of the limitations.

PO-6: The engineer and society:

Our graduates would have ability **to apply reasoning informed by contextual** knowledge to assess societal, health, safety, legal and cultural issues and consequent responsibilities relevant to professional engineering practice of electronics and communication engineering.

PO-7: Environment and sustainability:

Our graduates would have **ability to understand the impact of professional engineering solutions i**n societal and environmental context relevant to electronics and **demonstrate the knowledge of and need** for sustainable development relevant to electronics and communication engineering.

PO-8: Ethics:

Our graduates would show ability **to apply ethical principles and commit** professional ethics and responsibilities and norms of engineering practices relevant to electronics and communication engineering.

PO-9: Individual and team work:

Our graduates would demonstrate **ability to function effectively** as an individual **and leader in diverse teams in multidisciplinary settings** related to electronics and communication engineering.

PO-10: Communication:

Our graduates would **depict ability to communicate effectively on complex electronics and communication engineering and related activities with engineering** committee and with society at large such as being able to comprehend and write effective reports and design documentation, make effective presentation and give and receive clear instructions.

PO-11: Project management and finance:

Our graduates would depict **knowledge and understanding of engineering** and management principles relevant to electronics and communication engineering and apply these to once own work as a member and leader in a team to manage projects and in multidisciplinary environments.

PO-12: Life-long learning:

Our graduates would depict **ability to recognize** the need for and have the preparation to engage in lifelong learning in the broadest context of technological change in the field of electronics and communication engineering and related areas.

Paper Name	COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	P11	P12
EC301	CO1		V										
	CO2			V	V								
	CO3		V										
EC302	CO1		V										
	CO2		V			V	V						
	CO3		V										
EC303	CO1		V	V	V								
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	CO3		V										
	CO4		V										
EC304	CO1		V										
	CO2		V	V	V								
	CO3		V										
EC391	CO1		V			V	V						

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	CO4		V			V	V						
	CO5		V			V	V						
EC392	CO1		V			V	V						
	CO2		V				V	V					
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Ec401	CO1					V	V						
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EC402	CO1		V										
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EC403	CO1		V			V	V						
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ECS401	CO1		V		V								
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BSM401	CO1	V							V				
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Ec491	CO1		V			V	V						
	CO2		V				V	V					
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Ec492	CO1		V			V	V						
	CO2		V				V	V					
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EC493	CO1		V			V	V						
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BSMCS491	CO1	V				V	V						
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EC 501	CO1	V	V										
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EC502	CO1		V										
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EC503	CO1		V										
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EC504	CO1		V			V	V						
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EC591	CO1		V			V	V						
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EC592	CO1		V			V	V						
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EC593	CO1		V			V	V						
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EC601	CO1		V										
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EC602	CO1		V	V	V								
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EC691	CO1		V			V	V						
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EC692	CO1		V			V	V						
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EC681	CO1		V			V	V						
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EC702	CO1		V	V	V								

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EC781	CO1		V			V	V						
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PO Attainment 2021-2022

Paper Code	COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	P11	P12
EC301	CO1	0.75											
	CO2		0.75										
	CO3	0.75											
EC302	CO1	0.75											
	CO2	0.75		0.75									
	CO3	0.75											
EC303	CO1	0.78	0.78										
	CO2	0.78											
	CO3	0.78											

	CO4	0.78											
EC304	CO1	0.67											
	CO2	0.67	0.67										
	CO3	0.67											
ESCS301	CO1	0.75		0.75									
	CO2			0.75									
	CO3	0.75											
BSM301	CO1	.78											
	CO2		0.78										
	CO3			0.78									
EC391	CO1	0.81		0.81									
	CO2	0.81		0.81	0.81								
	CO3	0.81	0.81										
	CO4	0.81		0.81									
	CO5	0.81		0.81									
EC392	CO1	0.88		0.88									
	CO2	0.88		0.88	0.88								
	CO3		0.88										
	CO4	0.88		0.88									
	CO5	0.88		0.88									
ESCS391	CO1			0.81									
	CO2	0.81											
	CO3	0.81											
	CO4	0.81											
EC401	CO1			0.78									
	CO2	0.78											
	CO3	0.78											
	CO4	0.78											
EC402	CO1	0.75											
	CO2	0.75											
EC403	CO1	0.75		0.75									
	CO2	0.75	0.75										

ECS401	CO1	0.75	0.75									
	CO2	0.75	0.75									
	CO3	0.75										
	CO4	0.75		0.75								
	CO5	0.75										
BSM401	CO1	0.74				0.74						
	CO2	0.74										
	CO3	0.74	0.74									
	CO4	0.74										
EC491	CO1	0.82		0.82								
	CO2	0.82		0.82	0.82							
	CO3		0.82									
	CO4	0.82		0.82								
	CO5	0.82		0.82								
EC492	CO1	0.83		0.83								
	CO2	0.83		0.83	0.83							
	CO3		0.83									
	CO4	0.83		0.83								
	CO5	0.83		0.83								
EC493	CO1	0.93		0.93								
	CO2	0.93		0.93	0.93							
	CO3		0.93									
	CO4	0.93		0.93								
	CO5	0.93		0.93								
BSMCS491	CO1	0.61		0.61								
	CO2	0.61		0.61								
	CO3	0.61		0.61								
	CO4	0.61		0.61								
EC 501	CO1	0.7										
	CO2	0.7										
	CO3	0.7										
	CO4			0.7								
	CO5	0.7										

EC502	CO1	0.70											
	CO2			0.70									
	CO3			0.70									
	CO4					0.70							
EC503	CO1	0.64											
	CO2		0.64										
	CO3			0.64									
	CO4			0.64									
EC504	CO1	0.68		0.68									
	CO2	0.68		0.68									
	CO3	0.68		0.68									
EEEC505A	CO1	0.68											
	CO2	0.68											
EC591	CO1	0.83		0.83									
	CO2	0.83		0.83	0.83								
	CO3		0.83										
	CO4	0.83		0.83									
	CO5	0.83		0.83									
EC592	CO1	0.93		0.93									
	CO2	0.93		0.93	0.93								
	CO3		0.93										
	CO4	0.93		0.93									
	CO5	0.93		0.93									
EC593	CO1	0.94		0.94									
	CO2	0.94		0.94	0.94								
	CO3		0.94										
	CO4	0.94		0.94									
	CO5	0.94		0.94									
EC601	CO1	0.64											
	Co2	.64											
EC602	CO1	64%	64%										
	CO2	64%	64%										
PEEC603D	CO1	0.65											
	CO2	0.63											

	CO3	0.62											
EC604C	CO1	0.7			0.7								
	CO2	0.7											
	CO3	0.7	0.7	0.7									
	CO4	0.7			0.7								
EC691	CO1	0.90		0.90									
	CO2	0.90		0.90	0.90								
	CO3		0.90										
	CO4	0.90		0.90									
	CO5	0.90		0.90									
EC692	CO1	0.95		0.95									
	CO2	0.95		0.95	0.95								
	CO3		0.95										
	CO4	0.95		0.95									
	CO5	0.95		0.95									
EC681	CO1	0.90		0.90									
	CO2	0.90		0.90	0.90								
	CO3		0.90										
	CO4	0.90		0.90									
	CO5	0.90		0.90			0.90	0.90			0.90		
EC701B	CO1	0.73	0.73										
	CO2	0.73	0.73										
	CO3				0.68								
EC702C	CO1	0.71	0.71										
	CO2	0.71	0.71										
	CO3	0.71	0.71										
	CO4	0.71	0.71										
EC703A	CO1	0.74			0.74								
	CO2	0.74		0.74									
OEEC704A	CO1	0.73											
	CO2	0.73	0.73										
	CO3	0.73		0.73									

	CO4	0.73		0.73									
	CO5	0.73		0.73									
EC781	CO1	0.90		0.90									
	CO2	0.90		0.90	0.90								
	CO3		0.90										
	CO4	0.90		0.90									
	CO5	0.90		0.90			0.90	0.90			0.90		
EC782	CO1	0.92											
	CO2		0.92										
	CO3			0.92									
	CO4				0.92								
	CO5					0.92							
	CO6						0.92						
	CO7							0.92					
	CO8								0.92				
	CO9									0.92			
	CO10										0.92		
	CO11											0.92	
	CO12												0.92
PEEC801B	CO1	0.83	0.83										
	CO2	0.83	0.83										
OEEC802C	CO1	0.74											
	CO2	0.74											
	CO3	0.74		0.74									
OEEC803C	CO1		0.75										
	CO2		0.75										
	CO3			0.75									
EC881	CO1	0.95											
	CO2		0.95										
	CO3			0.95									
	CO4				0.95								

	CO5					0.95							
	CO6						0.95						
	CO7							0.95					
	CO8								0.95				
	CO9									0.95			
	CO10										0.95		
	CO11											0.95	
	CO12												0.95
EC882	CO1	0.95											
	CO2		0.95										
	CO3			0.95									
	CO4				0.95								
	CO5					0.95							
	CO6						0.95						
	CO7							0.95					
	CO8								0.95				
	CO9									0.95			
	CO10										0.95		
	CO11											0.95	
	CO12												0.95
Average PO Attainment		0.71 = **71%**	0.72 = **72%**	0.75 = **75%**	0.79 = **79%**	0.80 = **80%**	0.80 = **80%**	0.84 = **84%**	0.78 = **78%**	0.85 = **85%**	0.73 = **73%**	0.85 = **85%**	0.85 = **85%**

CALCUTTA INSTITUTE OF ENGINEERING AND MANAGEMENT

DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2020-2021

CO PO MAPPING FOR ODD SEMESTER,2019

PROGRAM OUTCOMES

PO-1: Engineering Knowledge:
Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO-2: Problem Analysis:
Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO-3: Design/development of solutions:
Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO-4: Conduct investigations of complex problems:
Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO-5: Modern tool usage:
Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

PO-6: The engineer and society:
Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO-7: Environment and sustainability:
Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO-8: Ethics:
Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO-9: Individual and team work:
Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO-10: Communication:
Communicate effectively on complex engineering activities with the engineering community and with

society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO-11: Project management and finance:
Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO-12: Life-long learning:
Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

CO to PO Mapping

PAPER NAME	COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	P11	P12
CE(ES)302	CO1		V										
	CO2			V	V								
CE(HS)302	CO1		V										
CE(ES)392	CO1		V	V	V								
CE(ES)401	CO1		V										
	CO2		V	V	V								
CE(ES)402)	CO1		V			V	V						
	CO2		V				V	V					
CE(PC)401	CO1		V			V	V						
	CO2		V				V	V					
CE(PC)402	CO1					V	V						
	CO2		V					V					
CE(PC)403	CO1		V					V					
	CO2		V						V				
CE(PC)404	CO1		V	V	V	V	V			V	V		
	CO2		V		V		V		V				
CE(HS)401	CO1		V	V	V								

	CO2		V		V	V							
CE(ES)491	CO1	V	V	V		V		V	V				
CE(ES)492	CO1		V			V	V						
	CO2		V	V			V	V					
CE(ES)493	CO1		V			V	V						
CE(PC)493	CO1		V			V	V						
CE(PC)494	CO1	V	V			V	V	V	V				
CE(PC)501	CO1	V	V		V		V		V	V			
	CO2		V	V	V			V					
CE(PC)502	CO1		V						V				
	CO2					V	V						
CE(PC)503	CO1		V										
	CO2				V	V							
CE(PC)504	CO1		V			V	V						
	CO2		V			V	V						
CE(PC)505	CO1		V	V	V		V						
	CO2		V										
CE(PC)506	CO1		V			V	V						
	CO2		V		V		V	V					
	CO3				V								
	CO4		V			V	V						
	CO5		V			V	V						
CE(PC)591	CO1		V			V	V						
CE(PC)594	CO1		V			V	V						
CE(PC)595	CO1		V	V									
CE(PC)596	CO1		V	V	V								
CE(PC)597	CO1		V										
CE(PC)601	CO1		V			V	V						
	CO2		V				V	V					
CE(PC)602	CO1		V			V	V						
	CO2		V				V	V					

CE(PC)603	**CO1**		**V**			**V**	**V**						
	CO2		**V**				**V**	**V**					
CE(PC)604	**CO1**		**V**	**V**	**V**			**V**	**V**				
	CO2		**V**	**V**	**V**			**V**		**V**	**V**		
CE(PE)601B	**CO1**		**V**		**V**				**V**	**V**			
	CO2		**V**				**V**				**V**		
CE(PE)602A	**CO1**		**V**			**V**	**V**						
	CO2		**V**				**V**	**V**	**V**	**V**			
CE(PC)693	**CO1**	**V**	**V**	**V**	**V**	**V**	**V**	**V**	**V**	**V**	**V**	**V**	**V**
CE(PC)694	**CO1**		**V**										
CE(PC)695	**CO1**		**V**										
CE(OE)701A	**CO1**	**V**	**V**	**V**	**V**	**V**	**V**	**V**	**V**	**V**	**V**	**V**	**V**
	CO2	**V**	**V**	**V**	**V**	**V**	**V**	**V**	**V**	**V**	**V**	**V**	**V**
CE(PE)701C	**CO1**	**V**	**V**	**V**	**V**	**V**	**V**	**V**	**V**	**V**	**V**	**V**	**V**
	CO2	**V**	**V**	**V**	**V**	**V**	**V**	**V**	**V**	**V**	**V**	**V**	**V**
CE(PE)702A	**CO1**	**V**	**V**	**V**	**V**	**V**	**V**	**V**	**V**	**V**	**V**	**V**	**V**
	CO2	**V**	**V**	**V**	**V**	**V**	**V**	**V**	**V**	**V**	**V**	**V**	**V**
CE(PE)703A	**CO1**	**V**	**V**	**V**	**V**	**V**	**V**	**V**	**V**	**V**	**V**	**V**	**V**
	CO2	**V**	**V**	**V**	**V**	**V**	**V**	**V**	**V**	**V**	**V**	**V**	**V**
CE(PE)704C	**CO1**	**V**	**V**	**V**	**V**	**V**	**V**	**V**	**V**	**V**	**V**	**V**	**V**
	CO2	**V**	**V**		**V**		**V**			**V**		**V**	
CE(PE)705A	**CO1**	**V**	**V**	**V**		**V**		**V**	**V**	**V**	**V**	**V**	
	CO2	**V**		**V**	**V**	**V**	**V**		**V**	**V**	**V**		
CE(IN)791	**CO1**	**V**	**V**	**V**		**V**	**V**			**V**	**V**	**V**	

CE(PROJ)792	CO2	V	V		V	V	V		V	V	V		V
CE(PE)801D	CO1	V	V	V	V	V		V	V	V			
	CO2		V	V	V	V		V		V	V	V	V
CE(0E)801C DEEP	CO1	V	V	V	V	V		V	V	V	V	V	V
	CO2		V			V		V	V	V	V	V	V
CE(CV)891	CO1	V	V	V	V	V	V	V	V	V	V	V	V
CE(PROJ)892	CO1	V	V	V	V	V	V	V	V	V	V	V	V

2021 ODD AND 2022 EVEN SEMESTER_CE													
PAPER NAME	COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO7	PO8	PO9	PO10	P11
CE(ES)302	CO1		0.70										
	CO2			0.74	0.80	0.70							
CE(HS)302	CO1	0.72	0.73										
CE(ES)392	CO1		0.72	0.69	0.86							0.88	
CE(ES)401	CO1	0.68	0.72										
	CO2		0.72	0.72	0.62								
CE(ES)402)	CO1		0.75			0.55	0.65						
	CO2	0.68	0.55				0.75	0.65					
CE(PC)401	CO1		0.63			0.63	0.53						
	CO2		0.67				0.73	0.73				0.63	
CE(PC)402	CO1	0.65		0.72		0.72	0.76						
	CO2		0.66					0.79	0.76				
CE(PC)403	CO1		0.68		0.74		0.54						
	CO2		0.74							0.64			
CE(PC)404	CO1		0.75	0.71	0.61	0.71	0.71		0.88		0.87	0.61	
	CO2		0.71		0.69		0.68			0.81	0.89		
CE(HS)401	CO1		0.76	0.72	0.70								
	CO2		0.76		0.66	0.68					0.86		0.71
CE(ES)491	CO1	0.67	0.74	0.70		0.74		0.74		0.74			
CE(ES)492	CO1		0.75			0.64	0.70		0.86				
	CO2		0.64	0.74			0.64	0.74					

CE(ES)493	CO1		0.73			0.65	0.71		0.85				
CE(PC)493	CO1		0.65			0.66	0.62						
CE(PC)494	CO1	0.63	0.73			0.73	0.73	0.83	0.84	0.53			
CE(PC)501	CO1	0.65	0.70		0.67		0.75			0.75	0.87		
	CO2		0.55	0.69	0.70			0.75					
CE(PC)502	CO1		0.74							0.80			
	CO2			0.69		0.73	0.75		0.88			0.88	
CE(PC)503	CO1		0.66										
	CO2	0.69			0.66	0.74							
CE(PC)504	CO1		0.78			0.71	0.73						
	CO2		0.78			0.72	0.64						
CE(PC)505	CO1		0.68	0.70	0.68		0.66					0.78	
	CO2	0.70	0.78										
CE(PC)506	CO1		0.69			0.73	0.72		0.83				
	CO2		0.71		0.74		0.73	0.83				0.83	
	CO3				0.73				0.83				
CE(PC)591	CO1		0.66			0.72	0.65				0.76	0.76	
CE(PC)594	CO1		0.64			0.70	0.72						
CE(PC)595	CO1		0.74	0.71					0.84				
CE(PC)596	CO1		0.73	0.72	0.68						0.72		
CE(PC)597	CO1		0.69						0.85			0.87	
CE(PC)601	CO1		0.67			0.68	0.67						
	CO2		0.68				0.68	0.78		0.73			
CE(PC)602	CO1		0.73			0.73	0.63						
	CO2		0.67				0.73	0.77				0.79	
CE(PC)603	CO1		0.73			0.69	0.67						
	CO2		0.74				0.72	0.73					
CE(PC)604	CO1		0.73	0.69	0.67			0.67		0.75			
	CO2		0.72	0.69	0.70			0.77			0.77	0.77	
CE(PE)601B	CO1		0.74		0.67				0.79	0.74	0.71		
	CO2		0.74				0.64		0.87			0.74	
CE(PE)602A	CO1		0.74			0.72	0.65						
	CO2		0.73				0.68	0.76	0.76	0.76	0.74		
CE(PC)6	CO1	0.6	0.71	0.66	0.68	0.71	0.69	0.76	0.87	0.76	0.70	0.76	0.70

93		6											
CE(PC)694	CO1	0.64	0.73						0.78		0.74		
CE(PC)695	CO1		0.70						0.79				
CE(OE)701A	CO1	0.77	0.70	0.68	0.63	0.66	0.67	0.77	0.77	0.77	0.68	0.79	0.67
	CO2	0.77	0.73	0.67	0.70	0.77	0.73	0.77	0.77	0.77	0.71	0.78	0.69
CE(PE)701C	CO1	0.73	0.72	0.65	0.65	0.73	0.69	0.81	0.81	0.81	0.73	0.88	0.71
	CO2	0.77	0.71	0.71	0.70	0.72	0.71	0.81	0.89	0.81	0.72	0.84	0.72
CE(PE)702A	CO1	0.76	0.72	0.70	0.64	0.74	0.66	0.86	0.86	0.86	0.67	0.86	0.66
	CO2	0.78	0.72	0.66	0.66	0.67	0.73	0.86	0.86	0.86	0.71	0.86	0.70
CE(PE)703A	CO1	0.72	0.70	0.73	0.63	0.65	0.73	0.83	0.86	0.83	0.76	0.83	0.73
	CO2	0.78	0.71	0.63	0.68	0.73	0.69	0.83	0.87	0.83	0.76	0.83	0.65
CE(PE)704C	CO1	0.64	0.74	0.56	0.66	0.56	0.66	0.86	0.86	0.86	0.75	0.86	0.70
	CO2	0.78	0.68	0.66	0.70	0.66	0.75	0.86	0.86	0.86	0.69	0.86	0.73
CE(PE)705A	CO1	0.59	0.69	0.69		0.71	0.70	0.79	0.82	0.79	0.68	0.79	0.69
	CO2	0.74		0.70	0.70	0.69	0.69	0.79	0.85	0.79	0.69	0.87	
CE(CV)791	CO1	0.70	0.70	0.68	0.67	0.78	0.72						
CE(PROJ)792	CO1	0.75	0.69	0.68	0.74	0.66	0.74	0.86	0.86	0.86	0.72	0.86	0.70
CE(PE)801D	CO1	0.66	0.66	0.66	0.76	0.67		0.76		0.76	0.72		
	CO2		0.67	0.70	0.70	0.69		0.76		0.76	0.71	0.89	0.69
CE(0E)801C DEEP	CO1	0.75	0.70	0.71	0.71	0.75		0.75	0.85	0.75	0.75	0.87	0.68
	CO2		0.65			0.72		0.75	0.75	0.75	0.69	0.83	0.69
CE(CV)891	CO1	0.63	0.73	0.73	0.80	0.81	0.82						
CE(PROJ)892	CO1	0.63	0.71	0.76	0.80	0.80	0.80	0.86	0.86	0.86	0.86	0.86	0.80
Average Attainment(decimal fraction)		0.70	0.70	0.69	0.70	0.70	0.69	0.66	0.63	0.70	0.70	0.64	0.70

Average Attainment(%)	**70**	**70**	**69**	**70**	**70**	**69**	**66**	**63**	**70**	**70**	**64**	**70**

Department: Computer Science & Engineering
PO Attainment of 2021-22

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
Data structure and algorithm PCC-CS301	CO1		0.80	0.80									
	CO2		0.84	0.84									
	CO3			0.88		0.88							
	CO4			0.91		0.91							
Data structure and algorithm Lab PCC- CS391	CO1	0.84	0.84	0.84									
	CO2	0.85	0.85										
	CO3		0.86			0.86							
	CO4		0.90			0.90							
Computer Organization PCC-CS302	CO1					0.84		0.84					
	CO2					0.87		0.87					
	CO3									0.88			
	CO4					0.93		0.93					
Computer Organization Lab PCC-CS392													
	CO1					0.82		0.82					
	CO2					0.83		0.83					
	CO3									0.85			
	CO4					0.94		0.94					
Compiler Design PCC-CS501													
	CO1	0.83				0.83	0.83						
	CO2					0.84		0.84				0.84	
	CO3		0.85	0.85	0.85						0.85		
	CO4	0.86	0.86			0.86	0.86	0.86				0.86	
	CO5	0.94	0.94			0.94	0.94	0.94				0.94	
Operating Systems PCC-CS502													
	CO1					0.83		0.83					
	CO2			0.87	0.87						0.87		
	CO3			0.88	0.88			0.88			0.88		
Operating Systems Lab PCC-CS592													
	CO1		0.85										
	CO2			0.86	0.86						0.86		
	CO3			0.87	0.87						0.87		

	CO4				**0.90**								
Object Oriented Programming **PCC-CS503**													
	CO1		**0.81**	**0.81**									
	CO2		**0.86**	**0.86**									
	CO3			**0.88**		**0.88**							
	CO4			**0.91**		**0.91**							
Object Oriented Programming Lab **PCC-CS593**													
	CO1	**0.82**	**0.82**	**0.82**									
	CO2	**0.85**	**0.85**										
	CO3		**0.86**			**0.86**							
	CO4		**0.92**			**0.92**							
Software Engineering ESC 501													
	CO1	**0.83**				**0.83**	**0.83**					**0.83**	
	CO2			**0.84**	**0.84**						**0.84**		
	CO3					**0.86**		**0.86**					
	CO4					**0.88**		**0.88**					
HSMC301 Economics for Engineers													
	CO1		**0.82**		**0.82**								
	CO2		**0.85**		**0.85**								
	CO3							**0.87**					**0.87**
Artificial Intelligence PEC-IT501B													
	CO1	**0.86**				**0.86**						**0.86**	
	CO2			**0.87**	**0.87**						**0.87**		
	CO3					**0.93**		**0.93**					
Industrial Management HSMC501,													
	CO1		**0.77**		**0.77**								

	CO2		**0.87**		**0.87**								
	CO3		**0.88**					**0.88**					
Introduction to Philosophical Thoughts **PEC-IT501B**													
	CO1		**0.77**										
	CO2		**0.86**										
	CO3		**0.87**		**0.87**								
Cloud Computing **PEC-CS701B**													
	CO1							**0.85**					
	CO2							**0.86**					
	CO3		**0.88**										
Cyber Security **PEC-CS 702E**													
	CO1		**0.86**		**0.86**								**0.86**
	CO2			**0.88**	**0.88**								
	CO3				**0.90**								
Project Management and Interpreneurship (HSMC701)													
	CO1		**0.76**		**0.76**								
	CO2		**0.86**		**0.86**								
	CO3		**0.87**										**0.87**
Design and Analysis of Algorithms **PCC-CS404**													
	CO1		**0.83**										
	CO2		**0.86**	**0.86**	**0.86**						**0.86**		

	CO3					**0.87**		**0.87**					
	CO4			**0.92**	**0.92**						**0.92**		**0.92**
	CO5					**0.93**		**0.93**					
Design and Analysis of Algorithm Lab PCC-CS494													
	CO1			**0.84**	**0.84**						**0.84**		
	CO2			**0.86**	**0.86**						**0.86**		
	CO3			**0.88**	**0.88**						**0.88**		
	CO4			**0.89**	**0.89**						**0.89**		
	CO5			**0.92**	**0.92**						**0.92**		
	CO6			**0.94**	**0.94**						**0.94**		
Computer Architecture PCC-CS402													
	CO1			**0.83**	**0.83**						**0.83**		
	CO2			**0.85**	**0.85**						**0.85**		
	CO3					**0.91**		**0.91**					
Computer Architecture Lab PCC-CS492													
	CO1			**0.85**	**0.85**						**0.85**		
	CO2			**0.92**	**0.92**						**0.92**		
	CO3					**0.94**		**0.94**					
Formal Language & Automata PCC-CS403													
	CO1		**0.84**										
	CO2			**0.85**	**0.85**						**0.85**		
	CO3					**0.85**		**0.85**					
	CO4			**0.87**	**0.87**						**0.87**		
	CO5					**0.88**		**0.88**					
	CO6		**0.88**										
	CO7												**0.89**

DBMS PCC-CS601													
	CO1		**0.83**										
	CO2			**0.87**	**0.87**						**0.87**		
	CO3		**0.94**										
	CO4				**0.95**								
DBMS LAB													
	CO1					**0.86**		**0.86**					
	CO2		**0.87**								**0.87**		
	CO3	**0.92**				**0.92**	**0.92**					**0.92**	
	CO4							**0.93**					
Computer Networks PCC-CS602													
	CO1			**0.83**		**0.83**							
	CO2	**0.85**	**0.85**			**0.85**							
	CO3				**0.87**	**0.87**							
	CO4				**0.93**	**0.93**							
ComputerNetworks Lab PCC-CS692	**CO1**		**0.83**					**0.83**					
	CO2		**0.86**		**0.86**								
	CO3							**0.88**					
	CO4				**0.93**								
PROJ-CS601	**CO1**		**0.83**										
	CO2		**0.93**		**0.93**								
	CO3							**0.95**					
Image Processing PEC-IT601D	**CO1**			**0.83**		**0.83**							
	CO2	**0.85**	**0.85**			**0.85**							
	CO3				**0.93**	**0.93**							
	CO4				**0.95**	**0.95**							

Pattern Recognition	**CO1**					**0.83**		**0.83**					
	CO2		**0.85**		**0.85**								
	CO3	**0.86**				**0.86**	**0.86**					**0.86**	
	CO4	**0.86**				**0.86**	**0.86**					**0.86**	
	CO5				**0.87**								
OEC-IT601B													
	CO1		**0.83**		**0.83**			**0.83**					
	CO2		**0.86**		**0.86**			**0.86**					
	CO3							**0.88**					**0.88**
Cryptography & Network Security CS801D	**CO1**		**0.83**										
	CO2		**0.84**		**0.84**								
	CO3	**0.85**	**0.85**				**0.85**	**0.85**					
	CO4		**0.91**		**0.91**								
	CO5		**0.93**										
E-Commerce & ERP OEC-CS802A													
	CO1				**0.83**								
	CO2					**0.85**		**0.85**					
	CO3	**0.85**				**0.85**	**0.85**					**0.85**	
	CO4					**0.86**		**0.86**					
	CO5	**0.91**				**0.91**	**0.91**					**0.91**	
Soft Skill &Interpersonal Communication OEC-CS801E,													
	CO1							**0.83**					
	CO2												**0.85**
	CO3							**0.88**					
BIOLOGY (BSC-401)													
	CO1					**0.83**		**0.83**					
	CO2				**0.84**			**0.84**					**0.84**
	CO3			**0.85**									**0.85**

	CO4											**0.86**
	CO5		**0.88**									
Average PO attainment		**0.86**	**0.85**	**0.86**	**0.87**	**0.87**	**0.87**	**0.87**	**0**	**0.86**	**0.87**	**0.87**	**0.86**
% Po attainment		**86%**	**85%**	**86 %**	**87%**	**87%**	**87%**	**87%**	**0%**	**86%**	**87%**	**87%**	**86%**

Program OutcomesWITH GRADUATE ATTRIBUTES for Management (MBA) Program:

1. PO1: Understand and evaluate the different aspects of business management theories including the required skills needed for effective leadership, organisational management, group/team work, communication, link with society, economy, and allied subjects/stakeholders.

   Covers the following Graduate Attributes :

   GA1: ENGINEERING KNOWLEDGE/BUSINESS ADMINISTRATION KNOWLEDGE

GA9: INDIVIDUAL AND TEAM WORK

GA10: COMMUNICATION

2. PO2: Identify, formulate, research, review literature on business administration/management/industry and provide solutions for real life problems faced by organisations or business set ups in present times/contemporary era

   Covers the following Graduate Attributes :

   GA2 : PROBLEM ANALYSIS

   GA3: DESIGN AND DEVELOPMENT OF SOLUTIONS

   GA4: INVESTIGATION OF COMPLEX PROBLEMS

3. PO3: Create, envision, select and apply appropriate techniques and resources/IT enabled tools of modern management including analytical/statistical tools to solve contemporary organisational issues/problems

Covers the following Graduate Attributes :

GA5: MODERN TOOL USAGE

GA11: LIFELONG LEARNING

4. PO4: Understand ethical, legal, responsible and sustainable organisational citizenship and apply interventions for the same to ensure all round development of the society and environment

   Covers the following Graduate Attributes :

   GA6: BUSINESS AND SOCIETY

   GA8: ETHICS

   GA7: ENVIRONMENT AND SUSTAINABILITY

5. PO5: Develop entrepreneurial mindset along with clear concepts of various business solutions concerning marketing, finance, project development, human resources, operations, training/development along with other allied fields in domestic and international markets.

   Covers the following GAs:

   GA12: PROJECT MANAGEMENT AND FINANCE
   GA11: LIFELONG LEARNING
   (covers most other GAs)

Mapping of COs to Pos

HR 401, MANPOWER PLANNING, RECRUITMENT& SELECTION

	PO1	PO2	PO3	PO4	PO5
CO1	H	M	M	M	H
CO2	H	H	H	H	H

HR 406, INTERNATIONAL HRM

	PO1	PO2	PO3	PO4	PO5
CO1	M	M	M	L	H
CO2	M	M	M	L	H

MB 102, ORGANIZATIONAL BEHAVIOUR

	PO1	PO2	PO3	PO4	PO5
CO1	H	M	M	M	M
CO2	H	M	M	M	M

MB 206, HUMAN RESOURCE MANAGEMENT

	PO1	PO2	PO3	PO4	PO5
CO1	H	M	M	M	H
CO2	H	M	M	M	H

HR 301, TEAM DYNAMICS AT WORK

	PO1	PO2	PO3	PO4	PO5
CO1	H	M	M	M	M
CO2	H	M	M	M	M

MB 303, Internship Project and Viva Voce

	PO1	PO2	PO3	PO4	PO5
CO1	M	M	M	M	M

Program Outcomes with Attainment percentage :

2020 Odd and 2021 Even Semester

Paper Name	COs	PO1	PO2	PO3	PO4	PO5
MB 101	CO1	0.84	0.84	0.84	0.84	0.84
	CO2	0.84	0.84	0.84	0.84	0.84
MB 102	CO1	0.88	0.88	0.88	0.88	0.88
	CO2	0.88	0.88	0.88	0.88	0.88
MB 103	CO1	0.83	0.83	0.83	0.83	0.83
	CO2	0.83	0.83	0.83	0.83	0.83
MB 104	CO1	0.83	0.83	0.83	0.83	
	CO2	0.83	0.83			0.83
MB 105	CO1		0.65			
	CO2	0.65				
	CO3		0.65			
	CO4	0.65				

MB 106	CO1	0.84	0.84			
	CO2	0.84	0.84			
MB 201	CO1	0.84	0.84	0.84	0.84	0.84
	CO2	0.84	0.84	0.84	0.84	0.84
MB 202	CO1	0.72	0.72	0.72	0.72	0.72
	CO2	0.72	0.72	0.72	0.72	0.72
MB 203	CO1	0.74				
	CO2		0.74	0.74		
	CO3			0.74	0.74	0.74
	CO4			0.74	0.74	
MB 205	CO1	0.94	0.94	0.94	0.94	0.94
	CO2	0.94	0.94	0.94	0.94	0.94
MB 206	CO1	0.90	0.90	0.90	0.90	0.90
	CO2	0.90	0.90	0.90	0.90	0.90
MB 301	CO1	0.95	0.95	0.95	0.95	0.95
	CO2	0.95	0.95	0.95	0.95	0.95
MB 302	CO1	0.82	0.82	0.82	0.82	0.82
	CO2	0.82	0.82	0.82	0.82	0.82
HR301	CO1	0.93	0.93	0.93	0.93	0.93
	CO2	0.93	0.93	0.93	0.93	0.93
HR304	CO1	0.82	0.82	0.82	0.82	0.82
	CO2	0.82	0.82	0.82	0.82	0.82
MM302	CO1	0.82		0.82	0.82	0.82
	CO2	0.82	0.82	0.82	0.82	
	CO3		0.82	0.82		
	CO4					0.82

MM303	CO1	0.80	0.80	0.80	0.80	
	CO2		0.80	0.80		
	CO3		0.80	0.80		
	CO4		0.80	0.80		0.80
HR 401	CO1	0.76	0.76	0.76	0.76	0.76
	CO2	0.76	0.76	0.76	0.76	0.76
HR 402	CO1	0.81	0.81	0.81	0.81	0.81
	CO2	0.81	0.81	0.81	0.81	0.81
HR 404	CO1	0.82	0.82	0.82	0.82	0.82
	CO2	0.82	0.82	0.82	0.82	0.82
MM401	CO1	0.83	0.83	0.83	0.83	
	CO2	0.83	0.83	0.83		0.83
MM 403	CO1	0.76				
	CO2	0.76	0.76	0.76	0.76	
	CO3		0.76	0.76	0.76	0.76
	CO4					0.76
MM404	CO1	0.76		0.76		
	CO2		0.76	0.76	0.76	
	CO3		0.76	0.76		
	CO4			0.76	0.76	
MM406	CO1	0.76				
	Co2		0.76	0.76		
	CO3			0.76	0.76	0.76
	CO			0.76	0.76	

FM401	CO1	0.76		0.76		
	CO2		0.76	0.76	0.76	
FM402	CO1		0.76	0.76		
	CO2			0.76	0.76	
FM405	CO1	0.76				
	CO2		0.76	0.76		
FM406	CO1			0.76	0.76	0.76
	CO2			0.76	0.76	
Average Attainment		**0.81**	**0.82**	**0.81**	**0.82**	**0.83**
% of Attainment		**81%**	**82%**	**81%**	**82%**	**83%**

PO NO.	BROAD	ELABORATE
1	Engineering knowledge	Apply the knowle engineering fundam
2	Problem analysis:	Identify, formulate, research literature, and analyse complex engineering problems reaching substantiated conclusions usi
3	Design/development of	Design solutions for complex engineering problems and desi public health and safety, and cultural, societal, and environme
4	Conduct investigations of	Use research-based knowledge and research methods includ interpretation of data, and synthesis of the information to prov
5	Modern tool usage:	Create, select, and apply appropriate techniques, resources, activities, with an understanding of the limitations.
6	The engineer and society:	Apply reasoning informed by the contextual knowledge to ass the professional engineering practice.
7	Environment and sustainability:	Understand the impact of the professional engineering solutio sustainable development.
8	Ethics:	Apply ethical principles and commit to professional ethics an
9	Individual and team work:	Function effectively as an individual, and as a member or lea
10	Communication:	Communicate effectively on complex engineering activities wi write effective reports and design documentation, make effect
11	Project management	Demonstrate knowledge and understanding of t h e engineer to manage projects and in multidisciplinary environments
12	Life-long learning:	Recognise the need for, and have the preparation and ability

PROGRAM SPECIFIC OUTCOMES

PSO1: Ability to apply the knowledge of Basic Computing, Basic Sciences and Social Sciences in the field of electrical engineering to identify, analyze and s life problems faced in industries and/or during research work.

PSO2: Ability to model, test, analyze and design components or processes rel modern power system involving both conventional and renewable energy reso voltage systems and energy management.

PSO3: Ability to apply the concept of circuit theory, electromagnetic field thec and basic electronics to solve complex problems of electrical machines and dri power electronic converters and electrical system design.

PSO4: Ability to identify and analyze the role of measurement, instrumentatic modern control engineering to enhance sustainability, reliability and efficiency electrical systems.
PSO5: Ability to demonstrate proficiency in operating and handling modern er tools to cop up with dynamic industrial environment.
PSO6: Ability to work and communicate effectively in the corporate life keepir responsible outlook towards socio-economic and environmental issues.

JRSE OUTCOMES

Nam

CO1	describe different type of networks, sources and signals with examples.
CO2	explain different network theorems, coupled circuit and tools for solution
CO3	apply network theorems and different tools to solve network problems.
CO4	select suitable techniques of network analysis for efficient solution.
CO5	estimate parameters of two-port networks.
CO6	design filter circuits.

Na

CO1	1. describe analog electronic components and analog electronics circuits
CO2	2. explain principle of operation of analog electronic components, filters,
CO3	3. compute parameters and operating points of analog electronic circuits.
CO4	4. determine response of analog electronic circuits.
CO5	5. distinguish different types amplifier and different types oscillators base
CO6	6. construct operational amplifier based circuits for different applications.

Name of

CO1	1. Relate different coordinate systems for efficient solution of electromag
CO2	2. describe mathematical s tools to solve electromagnetic problems.
CO3	3. explain laws applied to electromagnetic field.
CO4	4. apply mathematical tools and laws to solve electromagnetic problems.
CO5	5. analyze electromagnetic wave propagation
CO6	6. estimate transmission line parameters

Nam

Course	After completing this course, the students will be able to:
CO1	explain the co-ordinate system, principle of three dimensional rotation,kir
CO2	elaborate the theory of general motion, bending moment, torsional motio
CO3	develop free body diagram of different arrangements.

CO4	solve problems with the application of theories and principle of motion , fr
CO5	analyze torsional motion and bending moment.

N

CO1	explain basics of probability theories, rules, distribution and properties of
CO2	describe different methods of numerical analysis.
CO3	solve numerical problems based on probability theories , numerical analys
CO4	apply numerical methods to solve engineering problems.
CO5	5. solve engineering problems using z transform and probability theory.

Nam

Course	Upon completion of this course, students will be able to:
CO1	Describe with examples the biological observations lead to major discover
CO2	Explain the classification of kingdom of life the building blocks of life
CO3	Different techniques of bio physics used to study biological phenomena.
CO4	The role of imaging in the screening, diagnosis, staging, and treatments o
CO5	Identify DNA as a genetic material in the molecular basis of information t
CO6	Analyze biological processes at the reductionistic level.
CO7	Apply thermodynamic principles to biological systems.
CO8	Identify microorganisms..

Na

Course	After completing this course, the students will be able to:
CO1	Describe different features of Indian constitution.Power and functioning o
CO2	Identify authority to redress a problem in the profession and in the societ

Name o

Course	Up
CO1	Determine transient response of different electrical circuit, frequency res
CO2	Generate different signals in both discrete and analog form
CO3	Analyze amplitude and phase spectrum of different signals.
CO4	Verify network theorems.
CO5	Construct circuits with appropriate instruments and safety precautions.
CO5	Simulate electrical circuit experiments using suitable software.

Name

Course	Up
	At
CO1	Determine characteristics of full wave rectifier with filter and without filte
CO2	Verify function of DAC and ADC
CO3	Construct function generator using IC, R-C coupled amplifier,linear volta

CO4	Work in a team
CO5	Validate theoretical learning with practical Special Remarks: The above-m

Name

Course	Upon successful completion of the course, student will have:
CO1	Solve problems with Newton forward /backward, Lagrange's interpolatio
CO2	problems of numerical integration using Trapezoidal rule, Simpson's 1/3
CO3	rule, Weddle's rule problems to find numerical solution of a system of lin
CO4	Gauss elimination and Gauss-Seidel iterations. problems to find numerica
CO5	Ordinary differential equation by Euler's and Runga-Kutta methods.
CO6	Find appropriate numerical methods to solve engineering problems.
CO7	Use software package to solve numerical problems.

Na

Course	Up
CO1	Describe the function of different components of magnetic circuit, DC ma
CO2	Explain the principle of operation of different types of DC machines and tr
CO3	Solve numerical problems of DC machines and transformers.
CO4	Estimate the parameters and efficiency of transformer.
CO5	Determine the characteristics of DC machines
CO6	recommend methods to control output of DC machines.

Nam

Course	Up
CO1	Describe the function of different building blocks of digital electronics, ser
CO2	Explain the principle of operation of combinational and sequential digital c
CO3	Solve numerical problems of Boolean algebra, number system, combinati
CO4	Specify applications of combinational and sequential digital circuits.
CO5	Determine specifications of different digital circuits.
CO6	Design combinational and sequential digital circuits

Name of the S

Course	Up
CO1	Explain the terms accuracy, precision, resolution, speed of response, erro
CO2	Describe methods of measurement of power, energy by instruments and
CO3	Explain the principle of operation of analog meters, instrument transform
CO4	Explain the different building block, principle of operation of oscilloscope a
CO5	Solve numerical problems related to analog meters, instrument transform
CO6	Specify applications of analog and digital measuring instruments, sensors

Name o

Course	Upon successful completion of the course, student will have:

CO1	Describe the function of different components of boilers. Engines and turb
CO2	Explain the principle of operation of different types of boilers, turbines, IC
CO3	Solve numerical problems of boilers, turbines, IC engines and Gas turbine
CO4	Analyze the performance of boilers, engines and turbines.
CO5	Determine efficiency of boilers, engines and turbines.
CO6	Explain methods to control boiler, engines and turbines parameters.

Name of t

Course	Upon successful completion of the course, student will have:
CO1	1. Illustrate different aspects of human values, ethics, engineers' respons
CO2	2. Explain different principles, different theories and laws of engineering e
CO3	3. Identify different factors in the light of Engineers' responsibility toward
CO4	4. Correlate ethics of different work environment.
CO5	5. Explain the need for intellectual property rights.

Name

Course	Upon successful completion of the course, student will have:
CO1	Understand the natural environment and its relationships with human ac
CO2	Apply the fundamental knowledge of science and engineering to assess e
CO3	Develop guidelines and procedures for health and safety issues obeying th
CO4	Acquire skills for scientific problem-solving related to air, water, noise& la

Name of t

Course	Upon successful completion of the course, student will have:
CO1	Identify appropriate equipment and instruments for the experiment.
CO2	Test the instrument for application to the experiment.
CO3	Construct circuits with appropriate instruments and safety precautions
CO4	Validate different characteristics of DC machine , methods of speed contr
CO5	Work effectively in a team

Name of t

Course	Upon successful completion of the course, student will have:
CO1	Identify appropriate equipment and instruments for the experiment
CO2	2. Test the instruments for application to the experiment
CO3	3. Construct decoder , multiplexer, adder and subtractor circuits with app
CO4	4. Realize RS-JK and D flip flop, universal register with gates, multiplexer
CO5	5. Validate the operation of code conversion circuit –BCD to Excess 3 & vi
CO5	Work effectively in a team

Name of the Subjec

Course	Upon successful completion of the course, student will have:
	1. identify appropriate equipment and instruments for the experiment

	2. test the instrument for application to the experiment
	3. construct circuits with appropriate instruments and safety precautions
	4. evaluate and adjust the precision and accuracy of AC energy meter, m
	5. measure voltage, current, power, energy, phase , frequency, resistanc
	6. work effectively in a team

Name of the S

Course	Upon successful completion of the course, student will have:
CO1	Identify appropriate equipment and instruments for the experiment
CO2	Construct experimental setup with appropriate instruments and safety pr
CO3	Identify different parts of Lanchashire Boiler, Bahcock & Willcox Boiler, Co
CO4	Test 4 stroke petrol engine by electrical load box and diesel engine by ele
CO5	Find calorific value, flash point, fire point, cloud point, pour point of fuel.
C06	Work effectively in a team

Name of t

Course	On successful completion of the course the student will be able to:
	1. To understand the arrangement of windings of AC machines.
	2. To understand the principle of production of pulsating and revolving m
	3. To understand the principle of operation and characteristics of three ph
	4. To understand the principle of operation and characteristics of single p
	5. To understand the principle of operation and characteristics of synchro
	6. To understand the principle of operation and characteristics of special e
	7. To solve problems of Induction machines, synchronous machines and s

I

Course	After completion of this course the students will be able to:
CO1	To understand the basic principle of generation of Electricity from differen
CO2	To find parameters and characteristics of overhead transmission lines and
CO3	To find different parameters for the construction of overhead transmissio
CO4	To determine the performance of transmission lines.
CO5	To understand the principle tariff calculation.
CO6	To solve numerical problems on the topics studied.

N

Course	On completion of this course a student will be in a position to:
CO1	1. To find mathematical representation of LTI systems.
CO2	2. To find time response of LTI systems of different orders
CO3	3. To find the frequency response of LTI systems of different orders
CO4	4. To understand stabilityof differentLTI systems.
CO5	5. To analyze LTIsystems with state variables.
CO6	6. To solve problems of mathematical modelling and stability of LTI syste

Na

Course	On completion of this course a students will be able to
CO1	To understand the functioning and characteristics of power switching dev
CO2	To understand the principle of operation of converters.
CO3	To understand different triggering circuits and techniques of commutatior
CO4	To find external performance parameter of converters.
CO5	To analyze methods of voltage control, improvement of power factor and
CO6	To solve numerical problems of converters

Name of

Course	After completion of the course, the students will be able to:
CO1	identify appropriate equipment and instruments for the experiment.
CO2	test the instrument for application to the experiment.
CO3	construct circuits with appropriate instruments and safety precautions.
CO4	validate different characteristics of single phase Induction motor, three ph
CO5	work effectively in a team

Name c

Course	On completion of this course a students will be able to
CO1	identify appropriate equipment and instruments for the experiment.
CO2	test the instrument for application to the experiment.
CO3	3. construct circuits with appropriate instruments and safety precautions.
CO4	4. validate different characteristics of transmission line.
CO5	5. determine earth resistance, dielectric strength of insulating oil, breakd
CO6	6. analyze an electrical transmission line circuit with the help of software
CO7	7. work effectively in a team

Name c

Course	After completion of this course the students will be able to
CO1	identify appropriate equipment and instruments for the experiment.
CO2	test the instrument for application to the experiment.
CO3	construct circuits with appropriate instruments and safety precautions.
CO4	use MAT-Lab control system tool box, MAT-Lab- simulink tool box & PSPI
CO5	5. determinecontrol system specifications of first and second order syster

Name of

Course	On completion of this course a students will be able to
CO1	identify appropriate equipment and instruments for the experiment.
CO2	test the instrument for application to the experiment.
CO3	construct circuits with appropriate instruments and safety precautions

Name o

Course	On completion of this course a student will be in a position to:
CO1	differentiate how the choices of data structure & algorithm methods enha
CO2	solve problems based upon different data structure & also write programs
CO3	write programs based on different data structure
CO4	identify appropriate data structure & algorithmic methods in solving probl
CO5	discuss the computational efficiency of the principal algorithms for sortinc
CO6	comparethe benefits of dynamic and static data structures implementatio

Name of

Year: 3rd

Course	After completion of this course the students will be able to
CO1	specify simple abstract data types.
CO2	recognise features of object-oriented design such as encapsulation, polyn
CO3	inheritance, and composition of systems based on object identity.
CO4	apply common object-oriented design patterns
CO5	specify uses of common object oriented design patterns with examples.
CO6	design applications with an event-driven graphical user interface.

N

Course	After completion of the course, the students will be able to:
CO1	Represent power system components in line diagrams.
CO2	Determine the location of distribution substation.
CO3	Determine the performance of power system with the help of load flowv s
CO4	Analyse faults in Electrical systems.
CO5	Determine the stabilty of Power system.
CO6	Explain principle of operation of different power system protection equipn
CO7	Solve numerical problems related to representation, load flow, faults, stal

Name of th

Year: 3rd

Course	After completion of the course, the students will be able to
CO1	1. explain the architecture of 8086 and 8051.
CO2	2. do assembly language programming of 8086, 8051
CO3	3. interface different peripheral with 8086 and 8051
CO4	4. develop micro processor/ microcontroller based systems.
CO5	5. compare microprocessor, microcontroller, PIC and ARM processors

Nam

Course	On completion of this course a students will be able to
CO1	explain the principle of sampling and reconstrction of analog signal. syst
CO2	perform Z-transformation and inverse Z-tranaformation of systems.
CO3	analyse and design digital control
CO4	design compensators for digital control system to achieve desired specifi

CO5	represent digital control systems using state space models.
CO6	analyze the effect sampling on stability, controllability and observability

Na

Course	A
CO1	choose intelligently AC and DC transmission systems for the dedicated ap
CO2	identify the suitable two-level/multilevel configuration for high power cor
CO3	select the suitable protection method for various converter faults.
CO4	4. identify suitable reactive power compensation method.
CO5	5. decide the configuration for harmonic mitigation on both AC and DC sic
CO6	6. solve numerical problems related to converters, power flow analysis, re

Name

Course	After completion of this course the students will be able to
CO1	specify the rating of electrical machines with standard specifications.
CO2	explain the principles of electrical machine design and carry out basic des
CO3	3. determine the various factors which influence the design of electrical, r
CO4	4. explain the construction and performance characteristics of electrical m
CO5	5. use software tools to do design calculations.

Name of

Course	On completion of this course a students will be able to
CO1	explain the principle of Electric traction.
CO2	choose a suitable drive scheme for developing an electric hybrid vehicle d
CO3	design and develop basic schemes of electric vehicles and hybrid electric
CO4	choose proper energy storage systems for vehicle applications
CO5	implement different energy management strategies for hybrid vehicle.

Name

Course Outcomes	analyse uncompensated AC transmission line. explain the working principles of FACTS devices and their operating chara 3. apply FACTS devices for power flow control and stabilty. 4. identify different issues of power quality in distribution system. 5. apply different compensation and control techniques for DSTATCOM6.
Name of the Subject: INDUSTRIAL ELECTRICALSYSTEMS	
Subject Code: PE-EE-602C	
Year: 3rd	
Course Outcomes	1. Represent electrical wiring system for residential, commercial and indu 2. Determine the rating of components of residential and commercial elec 3. Design lighting scheme for a residential and commercial premises. 4. Select transformer, switchgear, protection equipments for industrial el 5. explain methods of automation of Industrial Electrical Systems 6. Solve numerical problems related to earthing system, lighting scheme,

Name of the Subject: DIGITAL SIGNALPROCESSING

Subject Code: PE-EE-601A

Year: 3rd

Course Outcomes	1. represent signals mathematically in continuous and discrete-time and i 2. analyse discrete-time systems using z-transform. 3. explain the Discrete-Fourier Transform (DFT) and the FFT algorithms. 4. design digital filters for various applications. 5. apply digital signal processing for the analysis of real-life signals.

Name of the Subject: COMMUNICATION ENGINEERING

Subject Code: PE-EE-601B

Year: 3rd

Course Outcomes	1. compare the performance of AM, FM and PM schemes with reference to 2. explain noise as a random process and its effect on communication rec 3. evaluate the performance of ASK, FSK, PSK, BPSK, QPSK in a digital co 4. identify source coding and channel coding schemes for a given commu 5. analyze various digital modulation methods 6. compute band width requirement and probability of error in various dig

Name of the Subject: VLSI AND MICROELECTRONICS

Subject Code: PE-EE-603C

Year: 3rd

Course Outcomes	1. explain the principle of design of VLSI circuits 2. explain different MOS structure with characteristics 3. apply different processes for VLSI fabrication 4. use programming language for the design of logic circuits 5. draw the stick diagram and layout for simple MOS circuits

Name of the Subject: ECONOMICS FOR ENGINEERS

Subject Code: HM-EE-601

Year: 3rd

Course Outcomes	1. evaluate the economic theories, cost concepts and pricing policies 2. explain the market structures and integration concepts 3. apply the concepts of financial management for project appraisal 4. explain accounting systems , the impact of inflation, taxation, depreciа 5. analyze financial statements using ratio analysis 6. explain financial planning, economic basis for replacement, project sch

Name of the Subject: POWER SYSTEM-II LABORATORY

Subject Code: PC-EE 691

Year: 3rd

Course Outcomes	1. Identify appropriate equipment and instruments for the experiment. 2. Test the instrument for application to the experiment. 3. Construct circuits with appropriate instruments and safety precautions 4. Validate the characteristics of under voltage relay, over current relay, (5. Validate protection schemes of transformer, generator, motor and feed 7. work effectively in a team

Name of the Subject: MICRO PROCESSOR AND MICRO CONTROLLERLABORATORY

Subject Code: : PC-EE 692

Year: 3rd

Course	1. identify appropriate equipment and instruments for the experiment

Outcomes	2. test the instrument for application to the experiment 3. construct circuits with appropriate instruments and safety precautions 4. program 8086 for arithmatic operation, sorting of array, searching for 5. interface ADC/DAC, 8255, 8251 to 8086 and LCD, keyboard to 8051 6. program 8051 using arithmatic, logical and bit manipulation instructior 7. work effectively in a team

Name of the Subject: ELECTRICAL AND ELECTRONICS DESIGNLABORATORY

Subject Code: PC-EE 681

Year: 3rd

Course Outcomes	1. explain basic concept of measurement, noise in electronic system, sens 2. implement PC based data acquisition systems 3. construct circuits with appropriate instruments and safety precautions 4. design heating elements, air core grounding reactor, power distributior 5. do wiring and installation design of a multistoried residential building w 6. design electronic hardware for controller of lift, speed of AC/DC motor,

Name of the Subject: ELECTRIC DRIVE

Subject Code: PC-EE 701

Year: 4TH

Course Outcomes	1. Explain the principle of operation of Electric Drive. 2. Describe different methods of starting and braking of Electric Drive. 3. Model and control DC Drive 4. Control speed of Induction and Synchronous motors. 5. Recommend drives for different applications. 6. Estimate ratings, variables and parameters of Electric Drives.

Name of the Subject: CONTROL SYSTEM DESIGN

Subject Code: PE-EE 701 A

Year: 4TH

Course Outcomes	1. explain the effect of gain, addition of pole and zeros on system's perfor 2. describe time domain and frequency domain design specifications. 3. demonstrate the effect of nonlinearity on system performance. 4. design control system in time domain , in frequency domain and in sta 5. design PID controllers. 6. select appropriate method for design of control system.

Name of the Subject: ELECTRICAL ENERGY CONSERVATION& AUDITING

Subject Code: : PE-EE 701B

Year: 4TH

Course Outcomes	1. explain the basic of energy resources, energy security, energy conserv 2. quantify the energy conservation opportunities in different thermal sys 3. quantify the energy conservation opportunities in different electrical sy 4. identify the common energy conservation opportunities in different ene 5. explain the methods of energy management and audit. 6. analyse and report the outcome of energy audit

Name of the Subject: POWER GENERATION ECONOMICS

Subject Code: : PE-EE 701C

Year: 4TH

Course	1. explain the different terms e.g. load factor etc for economics of genera

Outcomes	2. apply different types of tariff for electricity pricing. 3. optimize the operation of power system with unit commitment. 4. determine generation levels such that the total cost of generation beco 5. determine the state of the system given by the voltage magnitudes an 6. predict the power or energy needed to balance the supply and load de

Name of the Subject: ARTIFICIAL INTELLIGENCE

Subject Code: OE-EE-701A

Year: 4TH

Course Outcomes	1. explain the concept of knowledge representation and predicate logic ar 2. describe state space and its searching strategies 3. demonstrate profciency in applying scientifc method to models of mach 4. apply the machine learning concepts in real life problems 5. demonstrate an ability to share in discussions of AI, its current scope a

Name of the Subject: INTERNET OF THINGS

Subject Code: OE-EE-701B

Year:4TH

Course Outcomes	1. explain the definition and usage of the term "Internet of Things" in diff 2. explain the key components that make up an IoT system. 3. differentiate between the levels of the IoT stack and be familiar with t 4. build and test a IoT system involving prototyping, programming and da 5. apply cloud computing and data analytics in a typical IoT system

Name of the Subject: COMPUTER GRAPHICS

Subject Code: OE-EE-701C

Year: 4TH

Course Outcomes	1. explain Computer graphics and graphic systems. 2. test and implement line drawing algorithm, circle and ellipse drawing a 3. Perform 2D and 3D transformation and viewing. 4. apply algorithms for visible surface determination. 5. explain colors and shading models and ray tracing.

Name of the Subject: EMBEDDED SYSTEM

Subject Code: OE-EE 702A

Year: 4TH

Course Outcomes	1. discuss the definition, purpose, application, classification , quality char 2. explain the internal structure of the Embedded system. 3. interface IO devices and other peripherals with micro controllers in Em 4. write programs for Micro controllers in Embedded systems. 5. apply the concept of Embedded firmware in design of Embedded syste

Name of the Subject: DIGITAL IMAGE PROCESSING

Subject Code: OE-EE 702B

Year: 4TH

Course Outcomes	1. explain the fundamental concepts of a digital image processing system 3. apply different image segmentation techniques. 4. categorize various compression techniques. 5. implement image process and analysis algorithms. 6. apply image processing algorithms in practical applications.

Name of the Subject: COMPUTER NETWORK

Subject Code: : OE-EE 702C

Year: 4TH

Course Outcomes	1. explain the concepts of data communication and networking. 2. identify the different types of network topologies and protocols. 3. describe the function of a network system with OSI and TCP/IP model. 4. differentiate different types of routing protocol. 5. apply principles of congestion control . 6. implement different schemes for security of the networks.

Name of the Subject: PRINCIPLE OF MANAGEMEENT

Subject Code: : HM-EE 701

Year: 4TH

Course Outcomes	1. explain the concepts and approaches of management. 2. demonstrate the roles, skills and functions of management. 3. diagnose and solve organizational problems. 4. identify the complexities associated with management of human resou 5. apply different methods of Customer, Operation and Technology mana 6. acquire skills of good leader in an organization.

Name of the Subject: ELECTRIC DRIVE LABORATORY

Subject Code: PC-EE 791

Year: 4TH

Course Outcomes	1. identify appropriate equipment and instruments for the experiment. 2. test the instrument for application to the experiment. 3. construct circuits with appropriate instruments and safety precautions. 4. apply different methods of control of Electric Drive in the laboratory. 5. analyse experimental data obtained in the laboratory. 6. work effectively in a team

Name of the Subject: UTILIZATION OF ELECTRIC POWER

Subject Code: : PC-EE 801

Year: 4TH

Course Outcomes	1. explain the fundamentals of illumination and different lighting schemes 3. able to select appropriate lighting, heating and welding techniques for 4. apply different electrolysis process for different applications. 5. explain the principle of different aspect of Electric traction and control

Name of the Subject: LINE COMMUTATED AND ACTIVE PWM RECTIFIERS

Subject Code: PE-EE 801A

Year: 4TH

Course Outcomes	1. explain the principle of operation of different converters. 2. suggest the application of different filters. 3. apply converters for different applications. 4. analyze converter circuits. 5. develop appropriate scheme for control of different converters. 6. solve numerical problems relating to different converters.

Name of the Subject: POWER SYSTEM DYNAMICS AND CONTROL

Subject Code: PE-EE 801B

Year: 4TH

Course Outcomes	1. explain the model of power system components 2. select the appropriate model for required analysis. 3. analyze the performance of the system with small signal analysis.

	4. evaluate the stability of the single and multi machine systems. 5. develop measures for enhancing the stability of the system. 6. Solve numerical problems of linear dynamical system, modeling of diffe
Name of the Subject: ADVANCED ELECTRIC DRIVE	
Subject Code: PE-EE 801C	
Year: 4TH	
Course Outcomes	1. explain the principle of operation of converters for AC drives. 2. model Induction and Synchronous motor by reference frame theory. 3. apply different control methods to control speed and torque of Inductic 4. explain the configurations and method of speed control of BLDC, PMSM 5. realize basic blocks for DSP based motion control. 6. develop appropriate scheme for speed control of Induction and Synchr
Name of the Subject: INDUSTRIAL AUTOMATION AND CONTROL	
Subject Code: : PE-EE 801D	
Year: 4TH	
Course Outcomes	1. explain the basic structure of industrial automation and control 2. classify different types of control actions of controllers. 3. analyze control strategies of different processes of industry. 4. illustrate the construction and use of different types of actuators and c 5. use PLC, DCS and SCADA in advanced industrial control.
Name of the Subject: SOFT COMPUTING TECHNIQUES	
Subject Code: OE-EE 801A	
Year: 4TH	
Course Outcomes	1. explain soft computing techniques and their roles in building intelligent 2. anlyse the feasibility of application of soft computing techniques for a p 3. effectively use existing software tools to solve real problems using a sc 4. evaluate solutions by various soft computing approaches for a given pr 5. apply different soft computing techniques to solve Engineering problem
Name of the Subject: BIOMEDICAL INSTRUMENTATION	
Subject Code: OE-EE 801B	
Year: 4TH	
Course Outcomes	1. describe the principle of medical transducers for temperature, pressure 2. explain the principle of operation of Biomedical recorders, Medical Ima 3. use different Medical laboratory equipments for different tests . 4. analyze any measurement application and suggest suitable measurem 5. suggest suitable imaging methodology for a specific ailment.
Name of the Subject: INTRODUCTION TO MACHINE LEARNING	
Subject Code: OE-EE 801C	
Year: 4TH	
Course Outcomes	1. explain the basics concepts and classification of Machine Learning . 2. write simple programs using python. 3. describe Supervised Learning concepts. 4. explain the concept of Support Vector Machine. 5. describe unsupervised learning concepts and dimensionality reduction 6. apply Machine Learning in a range of real-world applications .
Name of the Subject: SENSORS AND TRANSDUCERS	
Subject Code: OE-EE 801D	

Year: 4TH

Course Outcomes	1. explain the basic principle of operation of Transducers and Sensors. 2. distinguish different sensors and transducers. 3. identify suitable transducer by comparing different industrial standards 4. estimate the performance of different transducers. 5. design real life electronics and instrumentation measurement systems

PROGRAMME OUTCOMES (PO) BASED ON G.A.

		PO1	PO2	PO3	PO4
Course Outcomes	CO1	0.67	0.67	0.67	0.67
	CO2	0.67	0.67	0.67	0.67
	CO3	0.67	0.67	0.67	
	CO4	0.67	0.67	0.67	0.67
	CO5	0.67	0.67	0.67	
	CO6	0.67	0.67	0.67	0.67
Course Outcomes	CO1	0.66	0.66	0.66	0.66
	CO2	0.66	0.66	0.66	0.66
	CO3	0.66	0.66	0.66	
	CO4	0.66	0.66	0.66	0.66
	CO5	0.66	0.66	0.66	
	CO1	0.74	0.74	0.74	0.74
Course Outcomes	CO2	0.74	0.74	0.74	0.74
	CO3	0.74	0.74	0.74	0.74
	CO4	0.74	0.74	0.74	0.74
	CO5	0.74	0.74	0.74	0.74
	CO6	0.74	0.74	0.74	0.74

	CO1	0.77	0.77	0.77	0.77
Course Outcomes	CO2	0.77	0.77	0.77	0.77
	CO3	0.77	0.77	0.77	0.77
	CO4	0.77	0.77	0.77	0.77
	CO5	0.77	0.77	0.77	0.77
	CO1	0.78	0.78		0.78
	CO2	0.78	0.78		0.78
Course Outcomes	CO3	0.78	0.78		0.78
	CO4	0.78	0.78		0.78
	CO5	0.78	0.78		0.78
	CO6	0.78	0.78		0.78
	CO1	0.75			
	CO2	0.75			0.75
Course Outcomes	CO3	0.75			0.75
	CO4	0.75			0.75
	CO5	0.75			0.75
	CO6	0.75			0.75
	CO1	0.92			
	CO2				
Course Outcomes	CO1	0.9	0.9	0.9	0.9
	CO2	0.9	0.9	0.9	0.9
	CO3	0.9	0.9	0.9	
	CO4	0.9	0.9	0.9	0.9
	CO5	0.9	0.9	0.9	
	CO6	0.9	0.9	0.9	0.9
Course Outcomes	CO1	0.89	0.89	0.89	0.89
	CO2	0.89	0.89	0.89	0.89
	CO3	0.89	0.89	0.89	
	CO4	0.89	0.89	0.89	0.89
	CO5	0.89	0.89	0.89	
	CO1	0.84	0.84		0.84
Course Outcomes	CO2	0.84	0.84		0.84
	CO3	0.84	0.84		0.84
	CO4	0.84	0.84		0.84
	CO5	0.84	0.84		0.84
	CO6	0.84	0.84		0.84
	CO1	0.87	0.87	0.87	0.87
Course Outcomes	CO2	0.87	0.87	0.87	0.87
	CO3	0.87	0.87		
	CO4	0.87	0.87		
	CO5	0.87	0.87		
	CO6	0.87	0.87	0.87	0.87
	CO1	0.76	0.76	0.76	0.76
Course Outcomes	CO2	0.76	0.76	0.76	0.76
	CO3	0.76	0.76	0.76	
	CO4	0.76	0.76	0.76	
	CO5	0.76	0.76	0.76	0.76

	CO6	0.76	0.76	0.76	0.76
	CO1	0.72	0.72	0.72	0.72
Course Outcomes	CO2	0.72	0.72	0.72	
	CO3	0.72	0.72	0.72	
	CO4	0.72			
	CO5	0.72			0.72
	CO6	0.72	0.72	0.72	
	CO1	0.71	0.71	0.71	0.71
Course Outcomes	CO2	0.71	0.71		
	CO3	0.71	0.71	0.71	
	CO4	0.71			
	CO5	0.71			0.71
	CO6	0.71	0.71	0.71	0.71
	CO1	0.88	0.88	0.88	0.88
Course Outcomes	CO2	0.88	0.88	0.88	
	CO3	0.88	0.88	0.88	
	CO4	0.88			
	CO5	0.88			0.88
	CO6	0.88	0.88	0.88	0.88
	CO1	0.95	0.95	0.95	0.95
Course Outcomes	CO2	0.95	0.95	0.95	
	CO3	0.95	0.95	0.95	
	CO4	0.95			
	CO5	0.95			0.95
	CO6	0.95	0.95	0.95	0.95
	CO1	0.76	0.76	0.76	0.76
Course Outcomes	CO2	0.76	0.76		
	CO3	0.76	0.76	0.76	
	CO4	0.76			
	CO5	0.76			0.76
	CO6	0.76	0.76	0.76	0.76
	CO1	0.92	0.92	0.92	0.92
Course Outcomes	CO2	0.92	0.92	0.92	
	CO3	0.92	0.92	0.92	
	CO4	0.92			
	CO5	0.92			0.92
	CO6	0.92	0.92	0.92	0.92
	CO1	0.91	0.91	0.91	0.91
Course Outcomes	CO2	0.91	0.91	0.91	
	CO3	0.91	0.91	0.91	
	CO4	0.91			
	CO5	0.91			0.91
	CO6	0.91	0.91	0.91	0.91
	CO1	0.87	0.87	0.87	0.87
Course Outcomes	CO2	0.87	0.87	0.87	
	CO3	0.87	0.87	0.87	
	CO4	0.87			

	CO5	0.87			0.87
	CO6	0.87	0.87	0.87	0.87
	CO1	0.67	0.67	0.67	
Course Outcomes	CO2	0.67			0.67
	CO3	0.67			0.67
	CO4				0.67
	CO5		0.67	0.67	
	CO6	0.67	0.67	0.67	
	CO1	0.84	0.84	0.84	
Course Outcomes	CO2	0.84			0.84
	CO3	0.84			0.84
	CO4				0.84
	CO5		0.84	0.84	
	CO6	0.84	0.84	0.84	
	CO1	0.71	0.71	0.71	
Course Outcomes	CO2	0.71			0.71
	CO3	0.71			0.71
	CO4				0.71
	CO5		0.71	0.71	
	CO6	0.71	0.71	0.71	
	CO1	0.92	0.92	0.92	
Course Outcomes	CO2	0.92			0.92
	CO3	0.92			0.92
	CO4				0.92
	CO5		0.92	0.92	
	CO6	0.92	0.92	0.92	
	CO1	0.63	0.63	0.63	
Course Outcomes	CO2	0.63			0.63
	CO3	0.63			0.63
	CO4				0.63
	CO5		0.63	0.63	
	CO6	0.63	0.63	0.63	
	CO1	0.87	0.87	0.87	
Course Outcomes	CO2	0.87			0.87
	CO3	0.87			0.87
	CO4				0.87
	CO5		0.87	0.87	
	CO6	0.87	0.87	0.87	
	CO1	0.68	0.68	0.68	
Course Outcomes	CO2	0.68			
	CO3	0.68			
	CO4				
	CO5		0.68	0.68	
	CO6	0.68	0.68	0.68	
	CO1	0.83	0.83	0.83	
Course Outcomes	CO2	0.83			
	CO3	0.83			

	CO4				
	CO5		0.83	0.83	
	CO6	0.83	0.83	0.83	
	CO1	NA	NA	NA	NA
Course Outcomes	CO2	NA	NA	NA	NA
	CO3	NA	NA	NA	NA
	CO4	NA	NA	NA	NA
	CO5	NA	NA	NA	NA
	CO6	NA	NA	NA	NA
	CO1		0.83	0.83	0.83
Course Outcomes	CO2	0.83	0.83		
	CO3	0.83	0.83		
	CO4	0.83			
	CO5	0.83		0.83	0.83
	CO6	0.83	0.83	0.83	0.83
	CO1	0.71	0.71	0.71	0.71
Course Outcomes	CO2	0.71	0.71		
	CO3	0.71	0.71		
	CO4	0.71			
	CO5	0.71		0.71	0.71
	CO6	0.71	0.71	0.71	0.71
	CO1	0.68	0.68	0.68	0.68
Course Outcomes	CO2	0.68	0.68		
	CO3	0.68	0.68		
	CO4	0.68			
	CO5	0.68		0.68	0.68
	CO6	0.68	0.68	0.68	0.68
	CO1	NA	NA	NA	NA
Course Outcomes	CO2	NA	NA	NA	NA
	CO3	NA	NA	NA	NA
	CO4	NA	NA	NA	NA
	CO5	NA	NA	NA	NA
	CO6	NA	NA	NA	NA
	CO1	0.73	0.73	0.73	0.73
Course Outcomes	CO2	0.73	0.73		
	CO3	0.73	0.73		
	CO4	0.73			
	CO5	0.73		0.73	0.73
	CO6	0.73	0.73	0.73	0.73
	CO1	0.89	0.89	0.89	0.89
Course Outcomes	CO2	0.89	0.89		
	CO3	0.89	0.89		
	CO4	0.89			
	CO5	0.89		0.89	0.89
	CO6	0.89	0.89	0.89	0.89
	CO1	0.65	0.65	0.65	0.65
Course	CO2	0.65	0.65		

Outcomes	CO3	0.65	0.65		
	CO4	0.65	0.65		
	CO5	0.65	0.65	0.65	0.65
	CO6	0.65	0.65	0.65	0.65
	CO1	0.89	0.89	0.89	0.89
Course Outcomes	CO2	0.89	0.89		
	CO3	0.89	0.89		
	CO4	0.89	0.89		
	CO5	0.89	0.89	0.89	0.89
	CO6	0.89	0.89	0.89	0.89
	CO1	0.92	0.92	0.92	0.92
Course Outcomes	CO2	0.92	0.92		
	CO3	0.92	0.92		
	CO4	0.92	0.92		
	CO5	0.92	0.92	0.92	0.92
	CO6	0.92	0.92	0.92	0.92
	CO1	0.68	0.68	0.68	0.68
Course Outcomes	CO2	0.68			0.68
	CO3	0.68			0.68
	CO4	0.68			0.68
	CO5	0.68	0.68	0.68	0.68
	CO6	0.68	0.68	0.68	0.68
	CO1	NA	NA	NA	NA
Course Outcomes	CO2	NA	NA	NA	NA
	CO3	NA	NA	NA	NA
	CO4	NA	NA	NA	NA
	CO5	NA	NA	NA	NA
	CO6	NA	NA	NA	NA
	CO1	NA	NA	NA	NA
Course Outcomes	CO2	NA	NA	NA	NA
	CO3	NA	NA	NA	NA
	CO4	NA	NA	NA	NA
	CO5	NA	NA	NA	NA
	CO6	NA	NA	NA	NA
	CO1	0.9	0.9	0.9	0.9
Course Outcomes	CO2	0.9	0.9	0.9	0.9
	CO3	0.9	0.9		
	CO4	0.9	0.9		
	CO5	0.9	0.9	0.9	0.9
	CO6	0.9	0.9	0.9	0.9
	CO1	NA	NA	NA	NA
Course Outcomes	CO2	NA	NA	NA	NA
	CO3	NA	NA	NA	NA
	CO4	NA	NA	NA	NA
	CO5	NA	NA	NA	NA
	CO6	NA	NA	NA	NA
	CO1	0.87	0.87	0.87	0.87

Course Outcomes	CO2	0.87	0.87	0.87	0.87
	CO3	0.87			0.87
	CO4	0.87	0.87	0.87	0.87
	CO5	0.87			
	CO6	0.87	0.87	0.87	0.87
	CO1	0.86	0.86	0.86	0.86
Course Outcomes	CO2	0.86	0.86	0.86	0.86
	CO3	0.86	0.86	0.86	0.86
	CO4	0.86	0.86		0.86
	CO5	0.86	0.86		0.86
	CO6	0.86	0.86		0.86
	CO1	0.83	0.83	0.83	0.83
Course Outcomes	CO2	0.83	0.83		
	CO3	0.83			
	CO4	0.83	0.83	0.83	0.83
	CO5	0.83	0.83	0.83	
	CO6	0.83	0.83	0.83	
	CO1	0.92	0.92	0.92	0.92
Course Outcomes	CO2	0.92	0.92		
	CO3	0.92			
	CO4	0.92	0.92	0.92	0.92
	CO5	0.92	0.92	0.92	
	CO6	0.92	0.92	0.92	
	CO1	NA	NA	NA	NA
Course Outcomes	CO2	NA	NA	NA	NA
	CO3	NA	NA	NA	NA
	CO4	NA	NA	NA	NA
	CO5	NA	NA	NA	NA
	CO6	NA	NA	NA	NA
	CO1	NA	NA	NA	NA
Course Outcomes	CO2	NA	NA	NA	NA
	CO3	NA	NA	NA	NA
	CO4	NA	NA	NA	NA
	CO5	NA	NA	NA	NA
	CO6	NA	NA	NA	NA
	CO1	0.82	0.82	0.82	
Course Outcomes	CO2	0.82	0.82	0.82	
	CO3	0.82	0.82	0.82	
	CO4	0.82	0.82	0.82	
	CO5	0.82	0.82	0.82	
	CO6	0.82	0.82	0.82	
	CO1	0.84	0.84	0.84	0.84
Course Outcomes	CO2	0.84	0.84	0.84	0.84
	CO3	0.84			
	CO4	0.84			
	CO5	0.84	0.84	0.84	0.84
	CO6	0.84	0.84	0.84	0.84

	CO1	NA	NA	NA	NA
Course Outcomes	CO2	NA	NA	NA	NA
	CO3	NA	NA	NA	NA
	CO4	NA	NA	NA	NA
	CO5	NA	NA	NA	NA
	CO6	NA	NA	NA	NA
	CO1	NA	NA	NA	NA
Course Outcomes	CO2	NA	NA	NA	NA
	CO3	NA	NA	NA	NA
	CO4	NA	NA	NA	NA
	CO5	NA	NA	NA	NA
	CO6	NA	NA	NA	NA
	CO1	NA	NA	NA	NA
Course Outcomes	CO2	NA	NA	NA	NA
	CO3	NA	NA	NA	NA
	CO4	NA	NA	NA	NA
	CO5	NA	NA	NA	NA
	CO6	NA	NA	NA	NA
	CO1	NA	NA	NA	NA
Course Outcomes	CO2	NA	NA	NA	NA
	CO3	NA	NA	NA	NA
	CO4	NA	NA	NA	NA
	CO5	NA	NA	NA	NA
	CO6	NA	NA	NA	NA
	CO1	0.82	0.82		
Course Outcomes	CO2	0.82	0.82	0.82	
	CO3	0.82	0.82	0.82	
	CO4	0.82	0.82	0.82	
	CO5	0.82	0.82	0.82	0.82
	CO6	0.82	0.82	0.82	0.82
	CO1	0.86	0.86		
Course Outcomes	CO2	0.86	0.86		
	CO3	0.86	0.86		
	CO4	0.86	0.86		
	CO5	0.86	0.86		
	CO6	0.86	0.86		
	CO1	0.91	0.91	0.91	0.91
Course Outcomes	CO2	0.91	0.91	0.91	0.91
	CO3	0.91	0.91	0.91	0.91
	CO4	0.91	0.91	0.91	0.91
	CO5	0.91	0.91	0.91	
	CO6	0.91	0.91	0.91	0.91
	CO1	0.92	0.92	0.92	0.92
Course Outcomes	CO2	0.92	0.92	0.92	0.92
	CO3	0.92	0.92	0.92	0.92
	CO4	0.92	0.92	0.92	0.92
	CO5	0.92	0.92	0.92	0.92

	CO6	0.92	0.92	0.92	0.92
	CO1	0.86	0.86		
Course Outcomes	CO2	0.86	0.86		
	CO3	0.86	0.86		
	CO4	0.86	0.86		
	CO5	0.86	0.86		
	CO6	0.86	0.86		
	CO1	0.87	0.87	0.87	0.87
Course Outcomes	CO2	0.87	0.87	0.87	0.87
	CO3	0.87	0.87	0.87	0.87
	CO4	0.87	0.87	0.87	0.87
	CO5	0.87	0.87	0.87	0.87
	CO6	0.87	0.87	0.87	0.87
	CO1	0.85	0.85		
Course Outcomes	CO2	0.85	0.85		0.85
	CO3	0.85	0.85		
	CO4	0.85	0.85		0.85
	CO5	0.85	0.85		0.85
	CO6	0.85	0.85		0.85
	CO1	0.94	0.94	0.94	0.94
Course Outcomes	CO2	0.94	0.94	0.94	0.94
	CO3	0.94	0.94	0.94	0.94
	CO4	0.94	0.94	0.94	0.94
	CO5	0.94	0.94	0.94	0.94
	CO6	0.94	0.94	0.94	0.94
	AVERAGE	0.818013937	0.822268908	0.819392265	0.81755814
	PERCENTAGE (%)	81	82	81	81

dge of mathematics, science,
nentals, and an engineering specialisation for the solution of complex engineering problem

ng first principles of mathematics, natural sciences, and engineering sciences.

gn system components or processes that meet the specified needs with appropriate consid
ental considerations.

ding design of experiments, analysis and
ide valid conclusions.

and modern engineering and IT tools, including prediction and modelling to complex engin

ess societal, health, safety, legal, and cultural issues and the consequent responsibilities

ns in societal and environmental contexts, and demonstrate the knowledge of, and need fo

d responsibilities and norms of the engineering practice.

der in diverse teams, and in multidisciplinary settings.

th the engineering community and with t h e society at large, such as, being able to compr
ive presentations, and give and receive clear instructions.

ing and management principles and apply these to one's own work, as a member and lead

y to engage in independent and life-long learning in the broadest context of technological c

olve real

lated to
urces, high

ory
ves,

ɔn and
' of

ıgineering

ıg a

e of the Subject: ELECTRIC CIRCUIT THEORY
Subject Code: : PC-EE 301
Year: 2nd (New Syllabus)

of networks.

me of the Subject: ANALOG ELECTRONICS
Subject Code: PC-EE 302
Year: 2nd (New Syllabus)

regulators and analog electronic circuits.

ɛd on application.

the Subject: ELECTRO MAGNETIC FIELD THEORY
Subject Code: PC-EE 303
Year: 2nd (New Syllabus)

ıetic problems.

e of the Subject: ENGINEERING MECHANICS
Subject Code: ES-ME 301
Year: 2nd (New Syllabus)

ıematics and kinetics of rigid bodies.
ɔn and friction.

riction and rigid bodies.

Name of the Subject: MATHEMATICS-III
Subject Code: BS- M 301
Year: 2nd (New Syllabus)

Z transform

sis and Z transform

e of the Subject: BIOLOGY FOR ENGINEERS
Subject Code: BS-EE- 301
Year: 2nd (New Syllabus)

ries.

of cancer.
transfer

me of the Subject: INDIAN CONSTITUTION
Subject Code: : MC-EE 301
Year: 2nd (New Syllabus)

f Union, state and local self-government.Structure, jurisdiction and function of Indian
y.

f the Subject: : Electric circuit theory Laboratory
Subject Code: PC-EE391
Year: 2nd (New Syllabus)

on successful completion of the course, student will have:
ponse of filters, Laplace transform and inverse Laplace transform

of the Subject: : Analog Electronic laboratory
Subject Code: PC-EE392
Year: 2nd (New Syllabus)

on successful completion of the course, student will have:
fter completion of this course, the learners will be able to
r (A)characteristics of BJT and FET,(B)characteristics of Zener diode as voltage regula

ge regulator using regulator IC chip.timer circuit using 555 for monostable, astable an

hentioned outcomes are not limited. Institute may redefine outcomes based their progr

of the Subject: : Numerical Methods laboratory

Subject Code: PC-CS 391

Year: 2nd (New Syllabus)

n

ear equations using

al solution of Algebraic Equation by Regularfalsi and Newton Raphson methods.

me of the Subject: : ELECTRIC MACHINE-I

Subject Code: PC-EE-401

Year: 2nd (New Syllabus)

on successful completion of the course, student will have:

chines and transformers

ransformers

ne of the Subject: : DIGITAL ELECTRONICS

Subject Code: PC-EE-402

Year: 2nd (New Syllabus)

on successful completion of the course, student will have:

niconductor memories and programmable logic devices.

circuits, A/D and D/A converter

onal & sequential digital circuits and A/D and D/A converter.

ubject: : ELECTRICAL & ELECTRONICS MEASUREMENTS

Subject Code: PC-EE-403

Year: 2nd (New Syllabus)

on successful completion of the course, student will have:

rs in measurement, loading effect

resistance, capacitance and inductance by bridges and potentiometer

er, digital multimeter, digital voltmeter, digital frequency meter, signal generator, stra

and measurement techniques of voltage, current, frequency and phase by oscilloscope

ner, measurement of power, energy, resistance, inductance and capacitance

and transducers

f the Subject: : THERMAL POWER ENGINEERING

Subject Code: ES-EE-401

Year: 2nd (New Syllabus)

ɔines
engines and Gas turbines.
es.

he Subject: : VALUES AND ETHICS IN PROFESSION
Subject Code: HM-EE-401
Year: 2nd (New Syllabus)

ibility and duties
ethics and social experimentation
s safety and risk

e of the Subject: : ENVIRONMEMTAL SCIENCE
Subject Code: MC-EE-401
Year: 2nd (New Syllabus)

tivities
environmental and health risk
he environmental laws and regulations
nd pollution.

the Subject: : ELECTRIC MACHINE-I LABORATORY
Subject Code: PC-EE491
Year: 2nd (New Syllabus)

ol of DC motor and parallel operation of the transformer

he Subject: : DIGITAL ELECTRONICS LABORATORY
Subject Code: PC-EE492
Year: 2nd (New Syllabus)

ɔropriate instruments and precaution
and flip-flops and asynchronous and synchronous up down counters
ice versa, 4 bit parity generator & comparator circuits,

t: : ELECTRICAL & ELECTRONICS MEASUREMENT LABORATORY
Subject Code: PC-EE493
Year: 2nd (New Syllabus)

oving iron and dynamometer type ammeter, voltmeter and wattmeter by potentiomet
e, inductance, capacitance

Subject: : THERMAL POWER ENGINEEING LABORATORY
Subject Code: ES-ME-491
Year: 2nd (New Syllabus)

ecautions
ochran Boiler, Vertical Tubular Boiler, Locomotive Boiler, 4S Diesel Engine, 4S Petrol En
ctrical load box and rope brake dynamometer

he Subject: ELECTRIC MACHINE-II PC-EE-501
Subject Code: PC-EE-501
Year: 3rd

agnetic fields.
hase Induction machines
hase Induction machines
nous machine
electromechanical devices.
special eletromechanical device.

Name of the Subject: POWER SYSTEM-I
Subject Code: : PC-EE-502
Year: 3rd (Old Syllabus)

nt sources
d cables.
n line

Name of the Subject: CONTROL SYSTEM
Subject Code: PC-EE-503
Year: 3rd

ms

me of the Subject: POWER ELECTRONICS

Subject Code: PC-EE-504
Year: 3rd

ices.

n of SCR

reduction of harmonics of the converter

the Subject: ELECTRIC MACHINE-IILABORATORY
Subject Code: : PC-EE 591
Year: 3rd

hase Inductionmotor, Induction generator and synchronous motor , methods of speed

of the Subject: POWER SYSTEM-I LABORATORY
Subject Code: PC-EE 592
Year: 3rd

own strength of solidinsulating material and dielectric constant of transformer oil.

of the Subject: CONTROL SYSTEMLABORATORY

Subject Code: PC-EE 593
Year: 3rd

ICE for simulation of systems.
ns.

the Subject: POWER ELECTRONICSLABORATORY
Subject Code: PC-EE 594
Year: 3rd

of the Subject: DATA STRUCTURE & ALGORITHM

Subject Code: OE-EE-501A
Year: 3rd

nce the performanceof the program.
s.

lem.
g, searching, and hashing
ns.
the Subject: OBJECT ORIENTED PROGRAMMING
Subject Code: OE-EE-501B

norphism,

Name of the Subject: POWER SYSTEM-II
Subject Code: PC-EE-601
Year: 3rd

studies.

ments.
bilty and protection ofpower system.
e Subject: MICROPROCESSOR & MICROCONTROLLER
Subject Code: PC-EE-602

e of the Subject: DIGITAL CONTROL SYSTEM
Subject Code: PE-EE-601A
Year: 3rd

tems.

cations.

ıme of the Subject: HVDC TRANSMISSION
Subject Code: PE-EE-601B
Year: 3rd

fter completion of this course the students will be able to
pplication(s).
ıverters.

des.
eactive power control.nts.

of the Subject: ELECTRICAL MACHINE DESIGN
Subject Code: PE-EE-601C
Year: 3rd

ign of an ac machine
magnetic and thermalloading of electrical machines
nachines.

the Subject: ELECTRICAL AND HYBRID VEHICLE
Subject Code: PE-EE-602A
Year: 3rd

lepending on resources.
vehicles.

e of the Subject: POWER QUALITYANDFACTS
Subject Code: PE-EE-602B
Year: 3rd

ıcteristics.

explain working principle of dynamic voltage restorer and UPQC

ıstrial consumers.
:trical systems.

ectrical systems.

power factor correction.

in the frequencydomain.

o SNR
eivers
ommunication system
nication link

gital modulation systems

ıtion

eduling, legal andregulatory issues applied to economic investment and project-mana

.
earth fault relay, on loadtime delay relay, off load time delay relay, CT and PT.
der. 6. Apply software tools to find bus voltage, currents and power flows throughout t

a number in a string andstring manipulation

ns of 8051

sor and signal conditioning circuits

;
n system for small township, double circuit transmission line and Electric machines
with lift and pump
and for an applicationwith analog, digital, mixed signal, microcontroller and PCB

rmance.

te space.

ation and pollution.
tems
stems
ergy intensive industrialequipments

ition.

›mes minimum for a definedlevel of load.
d phase angles at all buses.
mand at all the times.

nd transform the real lifeinformation in different representation

nine learning

and limitations, and societalimplications

erent contexts

he key technologies andprotocols employed at each layer of the stack
ata analysis

lgorithm, areafilling algorithms.

acteristics and attributesof Embedded Systems

bedded systems.

ms. 6. design RTOS based Embedded systems.

. 2. enhance images in the spatial and frequency domain using various transforms.

rces in the organizationsand integrate the learning in handling these complexities.
gement.

s. 2. explain the fundamental of Electrolytic processes, Electric heating and Welding.
specific applications.

of traction motor.

erent components and stability.

on and Synchronous motor.
1 and SRM.

onous motor.

ontrol valves.

machines
particular problem
oft computing approach
roblem.
ns.

e and respiration rate.
ging equipments Surgical & Therapeutic Instruments and Medical Laboratory Instrume

nent methods.

techniques.

s and procedures for measurement of physical parameters

. 6. apply smart sensors, bio-sensors, PLC and Internet of Things to different applicati

PO5	PO6	PO7	PO8	PO9	PO10
0.67					

0.78					
0.78					
	0.75				
		0.75			
		0.75			
		0.75			
	0.92	0.92			
	0.92	0.92			
0.9					
0.84					
0.84					
	0.76				

0.72	0.72			0.72	
	0.72			0.72	
	0.72				
0.72					
0.72					
0.71				0.71	
				0.71	
0.71					
0.71					
0.88	0.88			0.88	
	0.88			0.88	
	0.88				
	0.88				
0.88					
0.88					
0.95	0.95			0.95	
	0.95			0.95	
	0.95				
	0.95				
0.95					
0.95					
0.76					
	0.76				
	0.76				
0.76					
0.76					
0.92	0.92				
	0.92				
	0.92				
	0.92				
0.92					
0.92					
0.91	0.91				
0.91					
0.91					
0.87	0.87				
	0.87				
	0.87				
	0.87				

0.87					
0.87					
		0.67			
	0.67				
	0.67				
0.67	0.67	0.67		0.67	
0.67				0.67	
		0.84			
		0.84		0.84	
				0.84	
		0.71			
	0.71				
	0.71				
	0.71	0.71		0.71	
				0.71	
		0.92			
	0.92				
	0.92				
	0.92	0.92		0.92	
				0.92	
		0.63			
		0.63		0.63	
				0.63	
		0.87			
		0.87		0.87	
				0.87	
		0.68			
		0.68		0.68	
				0.68	
		0.83			

		0.83		0.83	
				0.83	
NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA
			0.83		
				0.83	
				0.83	
			0.83	0.83	0.83
				0.83	0.83
			0.71		
			0.71		0.71
					0.71
			0.68		
			0.68		0.68
					0.68
NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA
		0.73	0.73		
		0.73			
		0.73	0.73		0.73
					0.73
		0.89	0.89		
		0.89			
		0.89	0.89		0.89
					0.89
		0.65	0.65		

		0.65			
0.65					
0.65		0.65	0.65		0.65
0.65					0.65
		0.89	0.89		
		0.89			
0.89					
0.89		0.89	0.89		0.89
0.89					0.89
0.92					
0.92		0.92			
		0.92			
0.92		0.92	0.92		0.92
0.92					0.92
	0.68	0.68			
	0.68	0.68			
	0.68	0.68		0.68	
				0.68	
NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA
	0.9	0.9			
	0.9	0.9			
		0.9			
		0.9			
NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA

	0.87	0.87	0.87		
	0.87		0.87		
	0.87		0.87		
	0.86				
	0.86				
	0.86				
	0.86				
	0.86				
0.83					
0.83					
0.83					
0.83	0.83				
	0.83				
0.83					
0.92					
0.92					
0.92					
0.92	0.92				
	0.92				
0.92					
NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA
0.82		0.82	0.82		
0.82	0.82	0.82	0.82		
	0.82	0.82	0.82		
	0.82				
0.82	0.82				
0.82	0.82	0.82	0.82		
0.84	0.84	0.84			
		0.84			
0.84	0.84				
0.84	0.84				
		0.84			
0.84	0.84	0.84			

NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA
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CALCUTTA INSTITUTE OF ENGINEERING AND MANAGEMENT

DEPARTMENT OF INFORMATION TECHNOLOGY

ACADEMIC YEAR 2019-2020

CO PO MAPPING FOR ODD SEMESTER,2019

PROGRAM OUTCOMES

PO-1: Engineering Knowledge:
Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO-2: Problem Analysis:
Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO-3: Design/development of solutions:
Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO-4: Conduct investigations of complex problems:
Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO-5: Modern tool usage:
Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

PO-6: The engineer and society:
Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO-7: Environment and sustainability:
Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO-8: Ethics:
Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO-9: Individual and team work:
Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO-10: Communication:
Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO-11: Project management and finance:
Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO-12: Life-long learning:
Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

COURSE DETAILS

COURSE NAME	Physics I
COURSE CODE	**BS PH-101**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	1

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√											
CO2	√	√		√								
CO3	√	√	√	√								
CO4	√			√								
CO5	√	√		√								
CO6	√		√									

COURSE DETAILS

COURSE NAME	Mathematics I(A)
COURSE CODE	**BS-M(101)**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	1

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√										
CO2	√	√										
CO3	√	√										

COURSE DETAILS

COURSE NAME	Basic Electrical Engineering
COURSE CODE	**ES-EE101**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	1

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√		√								
CO2	√				√							
CO3	√						√					

COURSE DETAILS

COURSE NAME	Physics – I Laboratory
COURSE CODE	**BS PH-191**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	1

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√	√	√								
CO2	√	√		√								
CO3	√			√								
CO4	√	√		√								
CO5	√	√		√								

COURSE DETAILS

COURSE NAME	Basic Electrical Engineering Laboratory
COURSE CODE	**ES-EE191**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	1

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√					√						

CO2	√		√		√							
CO3	√				√							

COURSE DETAILS

COURSE NAME	Workshop/Manufacturing Practices
COURSE CODE	**ES - ME 192**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	1

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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COURSE DETAILS

COURSE NAME	Analog & Digital Electronics
COURSE CODE	**ESC301**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	3

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√		√									
CO2	√	√	√									
CO3	√		√									

COURSE DETAILS

COURSE NAME	Data Structure & Algorithm
COURSE CODE	**PCC-CS301**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	3

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√										
CO2		√	√									
CO3			√	√								
CO4		√		√								
CO5		√	√									

COURSE DETAILS

COURSE NAME	Computer Orgranization
COURSE CODE	**PCC-CS302**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	3

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√										
CO2			√									
CO3		√		√								
CO4			√	√	√							

COURSE DETAILS

COURSE NAME	Mathematics – III (Differential Calculus)
COURSE CODE	**BSC-301**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	3

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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CO3			√	√								
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CO5		√			√							

COURSE DETAILS

COURSE NAME	Economics for Engineers (Humanities – II)
COURSE CODE	**HSMC 301**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	3

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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COURSE DETAILS

COURSE NAME	Analog & Digital Electronics Laboratory
COURSE CODE	**ESC391**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	3

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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COURSE DETAILS

COURSE NAME	Data Structures and Algorithms
COURSE CODE	**PCC-CS391**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	3

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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COURSE DETAILS

COURSE NAME	Computer Organisation
COURSE CODE	**PCC CS-392**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	3

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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CO4			√		√							

COURSE DETAILS

COURSE NAME	IT Workshop (SciLab/MATLAB/Python/R)
COURSE CODE	**PCC-CS393**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	3

CO-PO MAPPING

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CO2		√	√						√			
CO3	√		√		√							
CO4	√	√	√	√								

COURSE DETAILS

COURSE NAME	Economics for Engineers
COURSE CODE	**HU 501**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	5

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		√	√									
CO2		√									√	√
CO3							√					

COURSE NAME	Design & Analysis of Algorithm
COURSE CODE	**IT 501**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	5

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			√	√								
CO2		√									√	
CO3			√		√							
CO4			√	√							√	
CO5		√	√									

COURSE NAME	Computer Arcghitecture
COURSE CODE	**IT 502**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	5

CO-PO MAPPING

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CO2	√	√	√		√							
CO3	√	√	√	√	√						√	

COURSE NAME	Operating System
COURSE CODE	**IT 503**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	5

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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CO2		√	√	√								
CO3	√		√									√
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CO5	√	√	√	√								√

COURSE NAME	Programing Practices using C++
COURSE CODE	**IT504F**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	5

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√										
CO2	√	√	√									
CO3	√	√	√	√								
CO4	√	√	√	√								

COURSE NAME	Algorithm Lab
COURSE CODE	**IT591**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	5

CO-PO MAPPING

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CO3			√		√							
CO4			√	√							√	
CO5		√	√									

COURSE DETAILS

COURSE NAME	Computer Architecture
COURSE CODE	**IT592**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	5

CO-PO MAPPING

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CO1		√	√		√							
CO2		√	√									

COURSE DETAILS

COURSE NAME	Operating System Lab
COURSE CODE	**IT593**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	5

CO-PO MAPPING

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CO2	√		√									
CO3	√		√									
CO4	√		√									

COURSE DETAILS

COURSE NAME	Programming Practices Using C++
COURSE CODE	**IT594F**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	5

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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CO2		√	√									
CO3	√	√										
CO4	√	√	√									

COURSE DETAILS

COURSE NAME	Internet Technology
COURSE CODE	**IT701**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	7

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√											
CO2	√	√	√		√							
CO3	√	√			√							
CO4	√	√	√	√	√							

COURSE DETAILS

COURSE NAME	Multimedia
COURSE CODE	**IT702**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	7

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√	√									
CO2			√	√	√							
CO3					√							
CO4			√		√						√	

COURSE DETAILS

COURSE NAME	E-Commerce
COURSE CODE	**IT703A**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	7

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		√										
CO2		√	√		√							
CO3					√							√
CO4			√	√								

COURSE DETAILS

COURSE NAME	Cloud Computing
COURSE CODE	**IT704B**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	7

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		√										
CO2	√	√										
CO3	√						√					
CO4												√

COURSE DETAILS

COURSE NAME	Advanced Data Communication & Coding
COURSE CODE	**IT705E**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	7

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√										
CO2	√	√	√									
CO3		√	√	√								
CO4		√	√	√	√							

COURSE DETAILS

COURSE NAME	Group Discussion
COURSE CODE	**HU781**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	7

CO-PO MAPPING

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CO1		√				√			√	√		
CO2		√	√	√				√	√			
CO3		√		√					√	√		√
CO4		√	√	√					√			√

COURSE DETAILS

COURSE NAME	Internet Technology
COURSE CODE	**IT791**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	7

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√		√		√							
CO2	√	√	√	√	√							
CO3	√	√	√	√	√							
CO4	√	√	√	√	√							

COURSE DETAILS

COURSE NAME	Multimedia
COURSE CODE	**IT792**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	7

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√	√		√							
CO2	√	√			√						√	
CO3		√	√	√	√						√	
CO4			√	√							√	
CO5		√	√		√						√	
CO6		√	√		√						√	

COURSE DETAILS

COURSE NAME	E-Commerce
COURSE CODE	**IT793A**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	7

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√	√									
CO2		√	√		√						√	
CO3		√	√	√								
CO4	√	√	√	√				√		√		

COURSE DETAILS

COURSE NAME	Industrial Training
COURSE CODE	**IT794**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	7

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√										√	√

CO2		√			√				√		√	
CO3		√	√			√				√		
CO4		√	√	√	√					√	√	

COURSE DETAILS

COURSE NAME	Project-1
COURSE CODE	**IT795**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	7

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1				√					√			
CO2		√							√	√		
CO3		√	√									
CO4			√	√								
CO5							√				√	
CO6									√	√	√	

Paper Name	**COs**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
BS PH-101	**CO1**	**0.81**											
	CO2		**0.72**	**0.72**									
	CO3	**0.75**			**0.75**								
	CO4					**0.83**							
	CO5		**0.69**		**0.69**								
	CO6			**0.79**	**0.79**								
BS-M(101)	**CO1**	**0.75**	**0.75**										
	CO2	**0.9**		**0.9**									
	CO3	**0.72**	**0.72**										

ES-EE101	CO1	0.7	0.7										
	CO2	0.75											
	CO3	0.7						0.7					
BS PH-191	CO1			0.72	0.72								
	CO2			0.8	0.8								
	CO3			0.78	0.78								
	CO4		0.85	0.85	0.85								
	CO5		0.75	0.75									
ES-EE191	CO1	0.75											
	CO2		0.65	0.65									
	CO3		0.7	0.7				0.7					
ES - ME 192	CO1			0.7									
	CO2	0.7		0.7									
	CO3			0.65									
	CO4	0.7	0.7										
BS CH-201	CO1		0.69	0.69									
	CO2	0.72											
	CO3	0.78											
	CO4	0.81											
	CO5			0.82	0.82	0.82							
BS-M201	CO1	0.9											
	CO2	0.75	0.75	0.75									
	CO3					0.7							
	CO4										0.85		
ES-CS201	CO1		0.7	0.7									
	CO2	0.6	0.6	0.6									
	CO3	0.7	0.7	0.7	0.7	0.7							
	CO4		0.65		0.65								
HM-HU201	CO1	0.62									0.62		
	CO2	0.58											
	CO3	0.75	0.75										
	CO4	0.64	0.64										
BS CH-291	CO1		0.72	0.72									
	CO2			0.78	0.78			0.78					
	CO3		0.83	0.83									
	CO4		0.76	0.76									
	CO5		0.84	0.84									
ES-CS291	CO1		0.9										
	CO2			0.9									
	CO3			0.8									
	CO4		0.85	0.85									
	CO5			0.9									
	CO6			0.8									
	CO7		0.75	0.75									
	CO8			0.8									

ES-ME291	**CO1**	**0.75**											
	CO2	**0.7**		**0.7**									
	CO3	**0.65**											
	CO4	**0.65**	**0.65**										
HM-HU291	**CO1**	**0.55**											
	CO2										**0.54**		
	CO3		**0.77**	**0.77**									
	CO4	**0.67**	**0.67**										
ESC301	**CO1**	**0.6**		**0.6**									
	CO2	**0.62**	**0.62**	**0.62**									
	CO3		**0.55**	**0.55**									
PCC-CS301	**CO1**	**0.79**	**0.79**										
	CO2		**0.83**	**0.83**									
	CO3			**0.8**	**0.8**								
	CO4		**0.82**		**0.82**								
	CO5		**0.71**	**0.71**									
PCC-CS302	**CO1**	**0.7**	**0.7**										
	CO2			**0.75**									
	CO3		**0.7**		**0.7**								
	CO4			**0.65**	**0.65**	**0.65**							
BSC-301	**CO1**	**0.7**	**0.7**										
	CO2	**0.72**	**0.72**	**0.72**									
	CO3			**0.75**	**0.75**								
	CO4			**0.7**	**0.7**								
	CO5		**0.74**			**0.74**							
HSMC 301	**CO1**		**0.58**	**0.58**									
	CO2		**0.59**									**0.59**	**0.59**
	CO3							**0.61**					
ESC391	**CO1**			**0.7**									
	CO2			**0.65**	**0.65**								
	CO3			**0.7**									
PCC-CS391	**CO1**	**0.85**		**0.85**		**0.85**							
	CO2	**0.8**		**0.8**		**0.8**							
	CO3				**0.82**	**0.82**							**0.82**
PCC CS-392	**CO1**		**0.8**										
	CO2			**0.8**									
	CO3			**0.8**		**0.8**							
	CO4			**0.8**		**0.8**							
PCC-CS393	**CO1**	**0.83**				**0.83**							
	CO2		**0.85**	**0.85**						**0.85**			
	CO3	**0.82**		**0.82**		**0.82**							
	CO4	**0.74**	**0.74**	**0.74**	**0.74**								
PCC-CS401	**CO1**	**0.75**											
	CO2	**0.8**	**0.8**										
	CO3	**0.75**	**0.75**										

	CO4	0.8	0.8										
	CO5			0.75		0.75							
PCC-CS402	CO1	0.75	0.75	0.75		0.75							
	CO2	0.85	0.85	0.85		0.85							
	CO3	0.8	0.8	0.8	0.8	0.8						0.8	
PCC-CS403	CO1	0.7											
	CO2		0.65	0.65									
	CO3			0.75									
	CO4				0.65								0.65
PCC-CS404	CO1	0.85	0.85										
	CO2		0.75	0.75									
	CO3		0.7	0.7									
	CO4		0.8	0.8									
	CO5		0.85	0.85									
	CO6		0.7	0.7									
	CO7		0.7			0.7							
	CO8		0.65			0.65							
BSC 401	CO1	0.82	0.82		0.82								
	CO2	0.81	0.81										
	CO3		0.78		0.78								
	CO4		0.83		0.83								
	CO5		0.75	0.75				0.75					
	CO6	0.79	0.79										
MC 401	CO1			0.8			0.8	0.8					
	CO2			0.82			0.82	0.82					
	CO3			0.84		0.84	0.84	0.84					
	CO4			0.8	0.8			0.8					
	CO5		0.88	0.88				0.88	0.88		0.88		
	CO6						0.89	0.89	0.89		0.89		
PCC-CS 492	CO1		0.95	0.95		0.95							
	CO2		0.85	0.85									
PCC-CS494	CO1			0.85	0.85								
	CO2		0.7									0.7	
	CO3			0.7		0.7							
	CO4			0.75	0.75							0.75	
	CO5		0.6	0.6									
ESC-501	CO1	0.85	0.85	0.85									
	CO2	0.8	0.8										
	CO3			0.9		0.9							
	CO4	0.7											
	CO5			0.65	0.65	0.65						0.65	
PCC-CS501	CO1	0.9	0.9	0.9									
	CO2			0.85		0.85							
	CO3			0.8							0.8		

	CO4			0.75	0.75								
PCC-CS502	CO1	0.6	0.6										
	CO2		0.7	0.7	0.7								
	CO3	0.65		0.65									0.65
	CO4		0.6		0.6								
PCC-CS503	CO1	0.7	0.7										
	CO2			0.8	0.8								
	CO3		0.65	0.65	0.65								
	CO4			0.8		0.8							
HSMC 501	CO1	0.59	0.59					0.59					
	CO2		0.61	0.61									
	CO3		0.62								0.62		
PEC-IT501B	CO1	0.6				0.6	0.6						
	CO2			0.7	0.7						0.7		
	CO3							0.75					
	CO4		0.7					0.7					
	CO5			0.6	0.6						0.6		
PEC-IT501C	CO1	0.7		0.7								0.7	
	CO2	0.85	0.85										
	CO3	0.75	0.75										
	CO4		0.7	0.7	0.7								
	CO5		0.65	0.65		0.65							
MC-CS501	CO1								0.72	0.72	0.72		0.72
ESC-591	CO1	0.85	0.85										
	CO2	0.9		0.9		0.9							
	CO3			0.6	0.6								
	CO4	0.75	0.75										
PCC-CS592	CO1	0.6		0.6									
	CO2	0.7		0.7									
	CO3	0.65		0.65									
PCC-CS593	CO1	0.93				0.93							
	CO2	0.92		0.92		0.92							
	CO3			0.95	0.95	0.95							0.95
PCC-CS601	CO1	0.8	0.8			0.8							
	CO2		0.75	0.75	0.75								
	CO3		0.7		0.7								
	CO4		0.75	0.75									
	CO5	0.7		0.7									
	CO6		0.65				0.65						0.65
PCC-CS602	CO1	0.7	0.7	0.7	0.7								
	CO2		0.7	0.7	0.7								
	CO3		0.75		0.75	0.75							0.75
PEC-IT601D	CO1		0.7		0.7								
	CO2									0.72			

	CO3												0.8
	CO4		0.6					0.6					
	CO5		0.75					0.75					
PEC-IT602D	CO1							0.6					
	CO2		0.7		0.7								
	CO3	0.75				0.75	0.75					0.75	
	CO4	0.7				0.7	0.7						
	CO5				0.6								
OEC-IT601B	CO1				0.75								
	CO2				0.6								
	CO3	0.7				0.7	0.7					0.7	
	CO4								0.75				
	CO5		0.6										
	CO6			0.6	0.6								
PROJ-CS601	CO1		0.78										
	CO2				0.82	0.82							
	CO3								0.67				
	CO4						0.79						
	CO5						0.75						
	CO6							0.85					
PCC-CS691	CO1	0.8		0.8		0.8							
	CO2			0.75		0.75							
	CO3			0.7		0.7							
	CO4			0.75		0.75							
	CO5	0.7				0.7							0.7
PCC-CS692	CO1		0.9										
	CO2	0.9	0.9										
	CO3			0.9									
	CO4			0.8	0.8								
PEC-IT701C	CO1		0.85										
	CO2	0.75	0.75										
	CO3	0.65						0.65					
	CO4												0.7
PEC-IT702A	CO1	0.77	0.77	0.77									
	CO2			0.76	0.76	0.76							
	CO3					0.73							
	CO4			0.72		0.72						0.72	
OEC-IT701C	CO1						0.83						
	CO2									0.81			0.81
	CO3								0.74	0.74			
	CO4						0.68				0.68		
HSMC 701	CO1						0.58	0.58					
	CO2										0.59	0.59	0.59
	CO3		0.6									0.6	0.6

PROJ-IT 781	**CO1**				**0.77**					**0.77**			
	CO2		**0.78**							**0.78**	**0.78**		
	CO3		**0.8**	**0.8**									
	CO4			**0.81**	**0.81**								
	CO5							**0.82**				**0.82**	
	CO6									**0.82**	**0.82**	**0.82**	
PEC-IT801B	**CO1**		**0.8**										
	CO2		**0.8**	**0.8**									
	CO3		**0.81**										
	CO4			**0.85**	**0.85**								
OEC-IT801A	**CO1**							**0.55**					
	CO2		**0.5**					**0.5**					
	CO3				**0.6**								
	CO4				**0.55**								
	CO5				**0.5**								
OEC-IT802A	**CO1**		**0.84**										
	CO2		**0.65**	**0.65**		**0.65**							
	CO3					**0.75**							**0.75**
	CO4			**0.72**	**0.72**								
PROJ CS 881	**CO1**			**0.78**		**0.78**						**0.78**	
	CO2					**0.82**				**0.82**			
	CO3					**0.81**		**0.81**		**0.81**			
	CO4								**0.8**			**0.8**	**0.8**
	CO5									**0.82**	**0.82**		
	CO6						**0.85**	**0.85**	**0.85**			**0.85**	**0.85**
Average PO Attainment		**0.74**	**0.74**	**0.75**	**0.73**	**0.78**	**0.75**	**0.73**	**0.79**	**0.79**	**0.73**	**0.73**	**0.73**
		74%	**74%**	**75%**	**73%**	**78%**	**75%**	**73%**	**79%**	**79%**	**73%**	**73%**	**73%**