PROGRAMME OUTCOMES (PO'S)

Engineering Graduates will be able to:

PO1. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. 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.

PO3. 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.

PO4. 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.

PO5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6. 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.

PO7. 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.

PO8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9. Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10. 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.

PO11. 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.

PO12. 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.

PROGRAMME SPECIFIC OBJECTIVE (PSO'S)

PSO1: To apply concepts and knowledge in Electronics & Telecommunication Engineering to design a variety of complex modules in the areas of analog and digital electronics, signal processing, networking and communication.

PSO2: To solve emerging real-world problems related to communication and also to perform the maintenance of various electronic communication systems.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOS)

The graduates of Electronics & Telecommunication Engineering will be able to

- **Prepare with strong foundation of Electronics and allied subjects so as to excel in professional career and research.**
- **Provide technical solutions for real life problems that are socially and economically acceptable.**
- **Inculcate with good communication skills, ethical values and ability to work as a team.**
- **Develop with an attitude for continuous learning by updating their knowledge to meet the ever changing technical demand.**

GOVINDRAO WANJARI COLLEGE OF ENGINEERING & TECHNOLOGY, NAGPUR

CRITERION NO.02

2.6.1 DEPARTMENTAL COURSE OUTCOMES

INDEX

GOVINDRAO WANJARI COLLEGE OF ENGINEERING & TECHNOLOGY, NAGPUR

COURSE OUTCOMES

COMPUTER SCIENCE & ENGINEERING DEPARTMENT

SECOND YEAR

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING-SEMESTER-III	
Name of Course: APPLIED MATHEMATICS THEORY	
Course code: BECSE201T	
Sr. No.	**Course Outcome (The Student would be able to)**
BECSE201T1	Identify Laplace transforms & inverse Laplace transforms to solve engineering problems.
BECSE201T2	Demonstrate Fourier series representation of a periodic function and use Techniques of Fourier transforms for various problems.
BECSE201T3	Define find the Z- Transform, inverse Z- Transforms of ability to solve problems in various branches of Engineering.
BECSE201T4	Understands analytic function of a complex variable and is able to apply its knowledge to solve contour integrations.
BECSE201T5	Determine Eigen values and eigenvectors and the solution of linear differential equation using matrix method.
BECSE201T6	Outline random variables corresponding to random experiments; Specify probability density and cumulative distribution functions.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING-SEMESTER-III	
Name of Course: ADVANCE "C" PROGRAMMING AND LOGIC DESIGN THEORY	
Course code: BECSE202T	
Sr. No.	**Course Outcome (The Student would be able to)**
BECSE202T1	Understand concept of arrays, string handling, and concept of handling variable data types using structures, building functions.
BECSE202T2	Understand concept of file, file handling programs study various file handling functions.
BECSE202T3	Understand the concept of pointer and memory allocation & using various DMA functions also to build program using pointer
BECSE202T4	Summarize graphic functions & Drawing images on the console by using various graphic functions
BECSE202T5	Recall basic knowledge of mathematical modeling & model of computation
BECSE202T6	Recall basic knowledge of imperative style programming also the concept of object oriented programming

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING-SEMESTER-III	
Name of Course: ADVANCE "C" PROGRAMMING AND LOGIC DESIGN LAB	
Course code: BECSE202P	
Sr. No.	**Course Outcome (The Student would be able to)**
BECSE202P1	Read and observe the execution of C programs using arrays, strings and structures.
BECSE202P2	Recall and convert input out through file programming in C.
BECSE202P3	Illustrate Programs using pointers.
BECSE202P4	Compare and contrast graphics programs in C.
BECSE202P5	Analyze the programs and various programming style.
BECSE202P6	Recall the concepts of object oriented Programming

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING-SEMESTER-III	
Name of Course: DIGITAL CIRCUIT & FUNDAMENTAL OF MICROPROCESSOR THEORY	
Course code: BECSE203T	
Sr. No.	**Course Outcome (The Student would be able to)**
BECSE203T1	Acquire basic knowledge about digital electronics and solving problems related to number systems and Boolean algebra.
BECSE203T2	Identify, analyze and design of various combinational circuits.
BECSE203T3	Recall various synchronous and asynchronous sequential circuits.
BECSE203T4	Analyze basic knowledge about Microprocessors and its need.
BECSE203T5	Understand the internal structure and interfacing of different peripheral devices with 8085 Microprocessor.
BECSE203T6	Understand the various instructions and programming using 8085 microprocessor.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING-SEMESTER-III	
Name of Course: DIGITAL CIRCUIT & FUNDAMENTAL OF MICROPROCESSOR LAB	
Course code: BECSE203P	
Sr. No.	**Course Outcome (The Student would be able to)**
BECSE203P1	Study and understand the fundamental of basic gates.
BECSE203P2	Understand the use of digital components as a switching elements
BECSE203P3	Use Boolean expression to realize logic circuits
BECSE203P4	Analyze simple combinational and sequential circuits
BECSE203P5	Analyze the architecture of microprocessor ICs
BECSE203P6	Interpret programs in assembly language for microprocessor.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING-SEMESTER-III	
Name of Course: ETHICS IN IT	
Course code: BECSE204T	
Sr. No.	**Course Outcome (The Student would be able to)**
BECSE204T1	Get fundamental Understanding and the role of ethics and its uses for IT user IT professionals, Business world.
BECSE204T2	Understand the essential issues related to information security, & to take precautions and use techniques and tools to defend against computer crimes.
BECSE204T3	Learn the key ethical, legal and social issues of information technology and to interpret and comply with ethical principles, laws, regulations, and institutional policies.
BECSE204T4	Apply creative thinking to solve basic technology problems in a business setting and Cultivate the critical and analytical thinking skills necessary to successfully manage ethical decisions and dilemmas in management.
BECSE204T5	Understand the core IT concepts of current and emerging technologies and learn to apply appropriate technologies to a tasks.
BECSE204T6	Ability to communicate, creates, and collaborate effectively using state-of-the-art information technologies in multiple modalities.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING-SEMESTER-III	
Name of Course: COMPUTER ARCHITECTURE & ORGANIZATION THEORY	
Course code: BECSE205T	
Sr. No.	**Course Outcome (The Student would be able to)**
BECSE205T1	Describe the Basic Structure of Computer Hardware and Software, Bus Structures, Memory Locations and Addresses instruction sequencing and addressing mode, assembly languages
BECSE205T2	To study Instruction Sets High Level Language consideration, IBM-370 and execution of Instructions.
BECSE205T3	Relate Microinstructions, micro program sequencing, perfecting microinstruction and Emulation.
BECSE205T4	How to represent number system, and to perform addition, subtraction, multiplication and division on signed and unsigned number.
BECSE205T5	To study Memories like Semiconductor RAM Memories, Semiconductor ROM Memories, Multiple Module Memories, Cache Memories, virtual Memories and Memory Management.
BECSE205T6	Identify the different architectural and organizational design issues that can affect the performance of a computer such as instruction set design, pipelining, RISC architecture and multicore architecture.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING-SEMESTER-III	
Name of Course: COMPUTER WORKSHOP-1 LAB	
Course code: BECSE206P	
Sr. No.	**Course Outcome (The Student would be able to)**
BECSE206P1	Describe different tools for Web Programming.
BECSE206P2	Demonstrate basics of HTML Tags
BECSE206P3	Develop a dynamic webpages by the use of HTML including forms, syntax, headings, linking, images, special characters and horizontal rules, lists, tables, forms.
BECSE206P4	Analyze the basics of CSS & its usage in Web Development
BECSE206P5	Construct web pages with HTML & CSS
BECSE206P6	Demonstrate competency in the use of common HTML code.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING-SEMESTER-III	
Name of Course: ENVIRONMENTAL ENGINEERING (AUDIT COURSE) THEORY	
Course code: BECSE207T	
Sr. No.	**Course Outcome (The Student would be able to)**
BECSE207T1	Summarize the importance and become aware of the upcoming environmental issues
BECSE207T2	Understand the importance of natural resources and can work for their conservation.
BECSE207T3	List down the knowledge about the various ecosystems existing in nature and their importance for conservation of nature
BECSE207T4	Learn about the biodiversity at local, national and global levels and the importance of wild life conservation
BECSE207T5	Summarize knowledge about different types of environmental pollution, their effects and control of pollution for the benefit of mankind.
BECSE207T6	Learn the social issues through various Acts under the constitutional provisions

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING-SEMESTER-IV	
Name of Course: DISCRETE MATHEMATICS AND GRAPH THEORY	
Course code: BECSE208T	
Sr. No.	**Course Outcome (The Student would be able to)**
BECSE208T1	Describe several areas of mathematics beyond calculus, express their interest
BECSE208T2	Demonstrate the Cartesian product of sets , Draw the graphs of various types of relations
BECSE208T3	The study of group theory aims to introduce students to some more sophisticated part advanced mathematics.
BECSE208T4	To know concepts of rings fields which Lattice and Boolean algebra for essential of mathematics.
BECSE208T5	Explain real-world problems using graphs and trees, both quantitatively and qualitatively.
BECSE208T6	Understand diverse counting strategies to solve varied problems involving strings, combinations, and distributions.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING-SEMESTER-IV	
Name of Course: DATA STRUCTURE & PROGRAM DESIGN THEORY	
Course code: BECSE209T	
Sr. No.	**Course Outcome (The Student would be able to)**
BECSE209T1	Apply algorithm analysis techniques to evaluate the performance of an algorithm and to compare data structures. And know when to apply standard algorithms for the creation, insertion, deletion, searching, and sorting of each data structure.
BECSE209T2	Implement the basic and advance concepts of stacks and queues through programming. Describe the concept of recursion, and its implementation using a stack.
BECSE209T3	Apply the concepts of Linked list on various problems and implement it.
BECSE209T4	Understand and apply fundamental algorithmic problems including Tree traversals, height balanced, weight balanced and AVL trees.
BECSE209T5	Analyze various searching techniques on graphs and shortest paths algorithms.
BECSE209T6	Analyze concepts of files including hash tables and collision handling techniques.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING-SEMESTER-IV	
Name of Course: DATA STRUCTURE & PROGRAM DESIGN THEORY LAB	
Course code: BECSE209P	
Sr. No.	**Course Outcome (The Student would be able to)**
BECSE209P	Recall different searching and sorting algorithms.
BECSE209P	Explain ADT for Stack data structure and its applications.
BECSE209P	Define ADT for Queue data structure and its applications.
BECSE209P	Demonstrate ability to apply knowledge of dynamic data structures like linked-lists and Extend its applications.
BECSE209P	Classify fundamentals of Tree data structures to implement Tree and problems including Tree traversals.
BECSE209P	Analyze Graph data structure and Graph traversals.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING-SEMESTER-IV	
Name of Course: OPERATING SYSTEM	
Course code: BECSE2010T	
Sr. No.	**Course Outcome (The Student would be able to)**
BECSE2010T1	Identify the different type of anoperating system and Understand the responsibilities of a an operating system
BECSE2010T2	Understand issues in different file systems. Describe the access methods for files and solve problems of disk scheduling
BECSE2010T3	Differentiate between a process and a thread and solve scheduling problems based on them
BECSE2010T4	Analyze the memory management problems with techniques like paging and segmentation and also use page replacement algorithms
BECSE2010T5	Describe the concurrency conditions and critical section problem and Apply the solutions to process synchronization problems
BECSE2010T6	Define a deadlock and implement methods for its avoidance, detection and mitigation and Identify goals of protection and implement the means of protection.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING-SEMESTER-IV	
Name of Course: OPERATING SYSTEM LAB	
Course code: BECSE2010P	
Sr. No.	**Course Outcome (The Student would be able to)**
BECSE2010P1	Compare different type of operating system.
BECSE2010P2	Show use of various file allocation techniques.
BECSE2010P3	Apply scheduling algorithm and solve scheduling problems.
BECSE2010P4	Analyze the program on memory management and page replacement algorithm.
BECSE2010P5	Discover the program using vi editor, the concurrency conditions and critical section problem.
BECSE2010P6	Explain the concept of deadlock and methods for its avoidance.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING-SEMESTER-IV	
Name of Course: THEORETICAL FOUNDATIONS OF COMPUTER SCIENCE THEORY	
Course code: BECSE2011T	
Sr. No.	**Course Outcome (The Student would be able to)**
BECSE2011T1	Apply principles of fundamental and computational mathematics to the field of computer engineering.
BECSE2011T2	Design finite automata to recognize a given regular language.
BECSE2011T3	Classify language into regular expression or finite automata or Transition graph.
BECSE2011T4	Define relationship between regular language and context free Grammar. Building a context free grammar for push down automata
BECSE2011T5	Explain Turing machine and solve the various problem Turing machine as computer of function
BECSE2011T6	Define the concept of computability. Be familiar with thinking analytically and intuitively for problem solving situation in related area of theory in computer science

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING-SEMESTER-IV	
Name of Course: System Programming	
Course code: BECSE2012T	
Sr. No.	**Course Outcome (The Student would be able to)**
BECSE2012T1	Understand system software such as assembler, macro-processor, linker, loader and compiler.
BECSE2012T2	Understand the concept of macroprocessor also design of macroprocessor
BECSE2012T3	Understand the concept of linker and Loader and design of linker, object file for different loading scheme
BECSE2012T4	Understand common object file formats and system utilities and study the editor and debugger
BECSE2012T5	Recognize appropriate device drivers for hardware and networking devices. And Compare architectural details of UNIX & Windows device drivers.
BECSE2012T6	Understand various phases of compiler and study scanners and parsers using LEX and YACC tools for lexical & syntactical analysis.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING-SEMESTER-IV	
Name of Course: COMPUTER WORKSHOP-2 LAB	
Course code: BECSE2013P	
Sr. No.	**Course Outcome (The Student would be able to)**
BECSE2013P1	Demonstrate the installation and configuration of a VM Ware & Linux Operating system.
BECSE2013P2	Demonstration of various basic command like help,,pwd,ls,cd,, etc.
BECSE2013P3	Demonstration of various basic commands related to directory like mkdir, rmdir, rm, mv.
BECSE2013P4	Super user basic command to add, modify and delete users and to understand basics of File systems.
BECSE2013P5	Demonstration of Directory commands, File related commands and Modify file permission and directory permission.
BECSE2013P6	Demonstration of command related to computer network.

THIRD YEAR

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING-SEMESTER-V	
Name of Course: Data Communication Theory	
Course code: BECSE301T	
Sr. No.	**Course Outcome (The Student would be able to)**
BECSE301T1	Analyze the concept type of data and data communication
BECSE301T2	Examine the Signal conversions and conflicting issues and resolution techniques in data transmission in communication media. (Wire and wireless)
BECSE301T3	Describe the mechanism and techniques of encoding.
BECSE301T4	Classify the signal conversion techniques
BECSE301T5	Describe Communication components, procedure and techniques that make it functional.
BECSE301T6	Simplifying Audio and Video data representation formats and compression technique.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING-SEMESTER-V	
Name of Course: Object Oriented Programming Theory	
Course code: BECSE302T	
Sr. No.	**Course Outcome (The Student would be able to)**
BECSE302T1	Recognize features of object oriented design such as encapsulation, polymorphism, ,Inheritance and composition of systems based on object and classes .
BECSE302T2	Demonstrate a thorough understanding of Overloading and their underline principles.
BECSE302T3	Apply good programming style and understand the impact of inheritance on developing and maintaining programs.
BECSE302T4	Construct programs on Virtual, Friend and Static functions and analyze their complexities
BECSE302T5	Classify streams and files in C++ and design the code using command line arguments.
BECSE302T6	Illustrate syntax and features of Class Template and multiple exceptions and utilize standard Template library.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING-SEMESTER-V	
Name of Course: Database Management System Theory	
Course code: BECSE303T	
Sr. No.	**Course Outcome (The Student would be able to)**
BECSE303T1	Identify the basic concepts and various data model used in database design ER modeling concepts and architecture use and design queries using SQL
BECSE303T2	Apply relational database theory and be able to Describe relational algebra expression, tuple and domain relation expression fro queries.
BECSE303T3	Recognize and identify the use of normalization and functional dependency, indexing and hashing technique used in database design.
BECSE303T4	Recognize/ identify the purpose of query processing and optimization and also demonstrate the basic of query evaluation.
BECSE303T5	Apply and Relate the concept of transaction, concurrency control and recovery in database.
BECSE303T6	Discuss recovery system and be familiar with introduction to web database, distribute databases, data warehousing and mining.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING-SEMESTER-V	
Name of Course: Database Management System Theory	
Course code: BECSE303P	
Sr. No.	**Course Outcome (The Student would be able to)**
BECSE303P1	Transform an information model into a relational database schema and to use a data definition language and/or utilities to implement the schema using a DBMS.
BECSE303P2	Use an SQL interface of a multi-user relational DBMS package to create, secure, populate, maintain, and query a database.
BECSE303P3	Formulate, using SQL, solutions to a broad range of query and data update problems.
BECSE303P4	Use a desktop database package to create, populate, maintain, and query a database.
BECSE303P5	Demonstrate a rudimentary understanding of programmatic interfaces to a database and be able to use the basic functions of one such interface.
BECSE303P6	Analyze an information storage problem and derive an information model expressed in the form.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING-SEMESTER-V	
Name of Course: Object Oriented Programming Theory	
Course code: BECSE302P	
Sr. No.	**Course Outcome (The Student would be able to)**
BECSE302P1	Develop program to illustrate basic concept of OOP features and C++ concept
BECSE302P2	Develop and implement program using unary and binary operator overloading
BECSE302P3	Develop program to implement concept of inheritance and polymorphism
BECSE302P4	Develop program to implement concept of abstract class and virtual functions
BECSE302P5	Construct program using console I/O and file I/O
BECSE302P6	Develop program using exception handling and templates

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING-SEMESTER-V	
Name of Course: Computer Graphics Theory	
Course code: BECSE304P	
Sr. No.	**Course Outcome (The Student would be able to)**
BECSE304P1	Explain the applications, areas, and graphic pipeline, display and hardcopy technologies
BECSE304P2	Apply and compare the algorithms for drawing 2D images also explain aliasing, anti-aliasing and half toning techniques
BECSE304P3	Discuss OpenGL application programming Interface and apply it for 2D & 3D computer graphics
BECSE304P4	Analyze and apply clipping algorithms and transformation on 2D images.
BECSE304P5	Solve the problems on viewing transformations and explain the projection and hidden surface removal algorithms.
BECSE304P6	Explain basic ray tracing algorithm, shading, shadows, curves and surfaces and also solve the problems of curves.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING-SEMESTER-V	
Name of Course: Design & Analysis of Algorithms Theory	
Course code: BECSE305T	
Sr. No.	**Course Outcome (The Student would be able to)**
BECSE305P1	Examine the correctness of algorithms using inductive proofs and design the solutions to recursive relations.
BECSE305P2	Explain Asymptotic Analysis and elaborate the methods of Amortized Analysis
BECSE305P3	Explain different algorithm design techniques like Divide and Conquer & Greedy strategy and make use of algorithms that employ this paradigm.
BECSE305P4	Determine the Dynamic Programming paradigm and solve Dynamic Programming algorithms and simplify them.
BECSE305P5	Design and illustrate the different traversal techniques and build different graph computations.
BECSE305P6	Explain Polynomial and Non polynomial time complexities and elaborate the deterministic and non-deterministic algorithms.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING-SEMESTER-V	
Name of Course: Design& Analysis of Algorithms Practical	
Course code: BECSE305P	
Sr. No.	**Course Outcome (The Student would be able to)**
BECSE305P1	Explain principles of designing algorithm and analyze asymptotic notation and its properties.
BECSE305P2	Explain different algorithm design techniques like Divide and Conquer.
BECSE305P3	Demonstrate Greedy strategy and its applications.
BECSE305P4	Solve Dynamic Programming algorithms and simplify them.
BECSE305P5	Design different traversal techniques and explain backtracking algorithms.
BECSE305P6	Explain Polynomial and Non polynomial for deterministic and non-deterministic algorithms.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING-SEMESTER-VI	
Name of Course: Artificial Intelligence Theory	
Course code: BECSE306T	
Sr. No.	**Course Outcome (The Student would be able to)**
BECSE306T1	Explain the concept behind problem representation paradigms & its characteristics, production system and defining problem as a state space representation.
BECSE306P2	Analyze various AI search algorithms (uninformed, informed, heuristic, constraint satisfaction, best-first search, problem reduction
BECSE306P3	Explain the fundamentals of knowledge representation (logic-based, frame-based, semantic nets), inference and theorem proving, Know how to build simple knowledge-based systems.
BECSE306P4	Demonstrate working knowledge of reasoning in the presence of incomplete and/or uncertain information by applying Bayesian Networks and Fuzzy Logic.
BECSE306P5	Ability to apply learning in problem solving , learning probabilistic models.
BECSE306P6	Apply the concept of knowledge engineering, learning, knowledge acquisition, understanding natural language.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING-SEMESTER-VI	
Name of Course: Design Patterns Theory	
Course code: BECSE307T	
Sr. No.	**Course Outcome (The Student would be able to)**
BECSE307T1	Identify and explain design principles and patterns in software.
BECSE307P2	Critically evaluate consequences of design patterns with respect to desired software qualities and case studies.
BECSE307P3	Select and demonstrate a related design pattern for a specific problem statement.
BECSE307P4	Understand the design patterns that are common in software applications and object oriented design.
BECSE307P5	Identify and implement appropriate solutions to recurring programming problems by consulting technical documentation and specifications, including design pattern catalogs and existing source code.
BECSE307P6	Analyze the complexity of design patterns.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING-SEMESTER-VI	
Name of Course: Design Patterns Practical	
Course code: BECSE307P	
Sr. No.	**Course Outcome (The Student would be able to)**
BECSE307P1	Understand how design patterns solve design problems.
BECSE307P2	Apply object-oriented method to the course project system analysis and design.
BECSE307P3	Develop design solutions using creational patterns.
BECSE307P4	Construct design solutions by using structural patterns.
BECSE307P5	Construct design solutions by using behavioral patterns.
BECSE307P6	Understand the Case studies and design the Model.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING-SEMESTER-VI	
Name of Course: Software Engineering & Project Management Theory	
Course code: BECSE308T	
Sr. No.	**Course Outcome (The Student would be able to)**
BECSE308T1	Apply the process to be followed in the software development life-cycle models.
BECSE308T2	Implement communication, modeling, and construction& deployment practices in software development.
BECSE308T3	Analyze & design the software models using unified modeling language (UML).
BECSE308T4	Explain the concepts of various software testing methods & be able to apply appropriate testing approaches for development of software.
BECSE308T5	Explain the quality management & different types of metrics used in software development.
BECSE308T6	Apply the concepts of project management & planning.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING-SEMESTER-VI	
Name of Course: Computer NetworkTheory	
Course code: BECSE309T	
Sr. No.	**Course Outcome (The Student would be able to)**
BECSE309T1	Explain different types of network topologies and protocols. enumerate and explain the functions of each layers of OSI and TCP/IP Model
BECSE309T2	Identify the types of Error and Error recovery mechanism.
BECSE309T3	Listing and explaining various Data Link layer Protocols like point to point protocol and multiple access protocols.
BECSE309T4	Analyze the concepts of Sub netting, Routing and listing, explain various routing algorithms
BECSE309T5	Compare and assess various Congestion control protocols and other network layer protocols.
BECSE309T6	To Assess the various parameters of Quality of Services and explain the concepts of ISDN, ATM reference model, SONET and Bluetooth Technology.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING-SEMESTER-VI	
Name of Course: Computer Networks Practical	
Course code: BECSE309P	
Sr. No.	**Course Outcome (The Student would be able to)**
BECSE309P1	Apply the process to be followed in the software development life-cycle models.
BECSE309P2	Analyze communication, modeling, and construction & deployment practices in software development.
BECSE309P3	Analyze & design the software models using unified modeling language (UML).
BECSE309P4	Explain the concepts of various software testing methods & be able to apply appropriate testing approaches for development of software.
BECSE309P5	Explain the quality management & different types of metrics used in software development.
BECSE309P6	Apply the concepts of project management & planning.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING-SEMESTER-VI	
Name of Course: MINI PROJECTS	
Course code: BECSE311P	
Sr. No.	**Course Outcome (The Student would be able to)**
BECSE311P1	FORMULATE a real world problem and develop its requirements also DESIGN solution for a set of requirements.
BECSE311P2	TEST and validate the conformance of the developed prototype against the original requirements of the problem.
BECSE311P3	TAKE PART IN team as a responsible member and possibly a leader of a team in developing software solutions
BECSE311P4	SUMMARIZE technical ideas, strategies and methodologies in written form and also prepare and conduct oral presentations
BECSE311P5	IDENTIFY new tools, algorithms, and/or techniques that contribute to the software solution of the project
BECSE311P6	DEVELOP alternative solutions, COMPARE them and SELECT the optimum one.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING-SEMESTER-VI	
Name of Course: Functional English	
Course code: BECSE310T	
Sr. No.	**Course Outcome (The Student would be able to)**
BECSE310T1	Study the Functional Grammar
BECSE310T2	Learn the English for Competitive Exams & Interview Techniques
BECSE310T3	Formal Correspondence Analytical comprehension
BECSE310T4	Survey of the Technical & Scientific Writing.

FINAL YEAR

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING-SEMESTER-VII	
Name of Course: Data Warehousing & Mining Theory	
Course code: BECSE401T	
Sr. No.	**Course Outcome (The Student would be able to)**
BECSE401T1	Combine Fundamental concepts of mining, various data mining functionalities and modify various preprocessing techniques.
BECSE401T2	Elaborate and improve multidimensional data model and data warehouse architecture.
BECSE401T3	Adapt basic concepts of association rule mining and correction and evaluate various association rule mining algorithms.
BECSE401T4	Discuss Basic concepts of classification and prediction. Also Evaluate various classification and prediction algorithms.
BECSE401T5	Interpret types of data in cluster analysis. Compare major clustering Method and invent various clustering methods.
BECSE401T6	Estimates Challenges in advanced data mining concepts such as Time Series data mining, Social Network Analysis, graph mining etc.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING-SEMESTER- VII	
Name of Course: Data Warehousing & Mining LAB	
Course code: BECSE401P	
Sr. No.	**Course Outcome (The Student would be able to)**
BECSE401P1	Create a dataset for any application in the .arff format.
BECSE401P2	Elaborate various preprocessing techniques and apply those techniques on the given data set.
BECSE401P3	Modify various association rule mining algorithms on the given data set
BECSE401P4	Modify various classification algorithms on the given data set.
BECSE401P5	Modify various clustering algorithms on the given data set.
BECSE401P6	Create a database using wamp server & design a database connectivity Between Weka & Wamp server.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING-SEMESTER- VII	
Name of Course: Language Processor Theory	
Course code: BECSE402T	
Sr. No.	**Course Outcome (The Student would be able to)**
BECSE402T1	Elaborate the concept of language translation and design complexities and various types of compilers. Show how finite automata can be used to design lexical analysis.
BECSE402T2	Evaluate syntax analysis and construct parser. combine different types of grammar and write context free grammar for different programming language.
BECSE402T3	Elaborate method of language generation using syntax directed translation scheme and its implementation for different programming language constructs.
BECSE402T4	Elaborate the use of symbol table and its design issues in compiler design. Different types of Errors , method to detect and correct these errors.
BECSE402T5	Elaborate the concept of code optimization techniques and its implementation
BECSE402T6	Interprete the issues in code generation and implementation of code generator. modify the different machine dependent optimization techniques.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING-SEMESTER- VII	
Name of Course: Language Processor LAB	
Course code: BECSE402P	
Sr. No.	**Course Outcome (The Student would be able to)**
BECSE402P1	Perceive the knowledge of patterns, tokens & regular expressions for solving a problem
BECSE402P2	Perceive the knowledge of lex tool & yacc tool to construct a scanner & parser
BECSE402P3	Compare different translators.
BECSE402P4	Conduct experiments for parser in compiler
BECSE402P5	Perceive the knowledge of modern compiler & its features.
BECSE402P6	Construct program to solve Run Time compilation and execution from command prompt

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING-SEMESTER- VII	
Name of Course: TCP and IP Theory	
Course code: BECSE403T	
Sr. No.	**Course Outcome (The Student would be able to)**
BECSE403T1	Compare the different types of network topologies and protocols.
BECSE403T2	Discuss the layers of the OSI model and TCP/IP.
BECSE403T3	Interprete the function(s) of each layer.
BECSE403T4	Interprete the different types of network devices and their functions within a network.
BECSE403T5	Build the skills of subnetting and routing mechanisms.
BECSE403T6	Discuss the basic protocols of computer networks, and how they can be used to assist in network design and implementation

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING-SEMESTER- VII	
Name of Course: Mobile Computing Theory	
Course code: BECSE404T	
Sr. No.	**Course Outcome (The Student would be able to)**
BECSE404T1	Elaborate basic concepts and application of Wireless communication,2GServices, types of channel and antennas.
BECSE404T2	Estimate the MAC protocols for GSM gain insight into SDMA, FDMA, TDMA and CDMA
BECSE404T3	Discuss the GSM architecture, protocols and their new data services.
BECSE404T4	Elaborate the mobile IP Network layer & TCP concept.
BECSE404T5	Elaborate the concepts and design issues of the architecture and the MANETprotocols.
BECSE404T6	Elaborate the protocols and platforms mobile computing WAP

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING-SEMESTER- VII	
Name of Course: Project and Seminar LAB	
Course code: BECSE405P	
Sr. No.	**Course Outcome (The Student would be able to)**
BECSE405P1	Determine relevant knowledge and skills, which are acquired within the technical area, to a given problem.
BECSE405P2	Discuss roles with clear lines of responsibility and accountability.
BECSE405P3	Modify software engineering principles and also core engineering principles.
BECSE405P4	Choose different programming languages and software tools.
BECSE405P5	Estimate a strong working knowledge of ethics and professional responsibility.
BECSE405P6	Evaluate real world problems to Contribute in society by developing solutions.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING-SEMESTER-VIII	
Name of Course: Distributed Operating system Theory	
Course code: BECSE406T	
Sr. No.	**Course Outcome (The Student would be able to)**
BECSE406T1	Discuss the basic fundamentals of Distributed OS . like models, features,concept ,design issues and fundamentals of distributed system
BECSE406T2	Invent the mutual exclusion.
BECSE406T3	Elaborate the deadlock detection and agreement protocol of distributed OS.
BECSE406T4	Elaborate the distributed file system and distributed shared memory.
BECSE406T5	Discuss various Distributed scheduling algorithm and load distributed algorithm.
BECSE406T6	Estimate fault tolerance and failure recovery.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING-SEMESTER-VIII	
Name of Course: Name of Course: Distributed Operating system LAB	
Course code: BECSE406P	
Sr. No.	**Course Outcome (The Student would be able to)**
BECSE406P1	Discuss the basic fundamentals of Distributed OS .like models, features,concept ,design issues and fundamentals of distributed system.
BECSE406P2	Discuss the mutual exclusion.
BECSE406P3	Evaluate the deadlock detection and agreement protocol of distributedOS.
BECSE406P4	Elaborate the distributed file system and distributed shared memory.
BECSE406P5	Elaborate various Distributed scheduling algorithm and load distributedalgorithm.
BECSE406P6	Estimate fault tolerance and failure recovery.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING-SEMESTER-VIII	
Name of Course: Information & Cyber Security Theory	
Course code: BECSE407T	
Sr. No.	**Course Outcome (The Student would be able to)**
BECSE407T1	Discuss the need of information security, legal, professional issues and attributes, network security threats and determine efforts to counter them& also formulate solutions
BECSE407T2	Modify codes for relevant cryptographic algorithms & Explain how threats in an organization are discovered, analyzed and dealt with.
BECSE407T3	Elaborate fundamentals of public key cryptography algorithms to implement and develop them for different problems
BECSE407T4	Discuss a secure client and server and discover external and internal threats in an organization during message exchange.
BECSE407T5	Imagine security issues and modify technologies like firewalls, its requirement and configurations and other technologies for making a secure system.
BECSE407T6	Elaborate security, its application and management for any modern organization and select appropriate techniques to tackle and solve problems in the discipline of information security e.g. vulnerability software

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING-SEMESTER-VIII	
Name of Course: Information & Cyber Security LAB	
Course code: BECSE407P	
Sr. No.	**Course Outcome (The Student would be able to)**
BECSE407P1	Build programs to illustrate the basic concept of encryption and decryption for secure data transmission
BECSE407P2	Design programs for various secrete key cryptography techniques.
BECSE407P3	Design programs for different security problems using public key cryptographic techniques
BECSE407P4	Design and develop algorithms and message keys during message exchange for secure data communication
BECSE407P5	compare various IP Security strategies for making secure system
BECSE407P6	Design and implement various programming scripts to achieve secure system

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING-SEMESTER-VIII	
Name of Course: Pattern Recognition Theory	
Course code: BECSE408T	
Sr. No.	**Course Outcome (The Student would be able to)**
BECSE408T1	Elaborate the concept of Pattern recognition, it's terminologies and application.
BECSE408T2	Build various probability distribution and density functions for statistical decision making.
BECSE408T3	Elaborate the class of Pattern applying Baye's theorem by using parametric decision making.
BECSE408T4	Elaborate different classifier like Support Vector machine, Hidden MarkovModel etc.
BECSE408T5	Compose various types of Non Linear decision makingTechniques.
BECSE408T6	Compare and contrast various clustering techniques.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING-SEMESTER-VIII	
Name of Course: Clustering & Cloud ComputingTheory	
Course code: BECSE408T	
Sr. No.	**Course Outcome (The Student would be able to)**
BECSE408T1	Elaborate the concept of cloud computing paradigm and list its various forms of services.
BECSE408T2	Formulate suitable virtualization concepts and Elaborate the architecture, infrastructure and delivery models of cloud computing
BECSE408T3	Discuss the fundamentals of Big data analysis, Map reduce frameworks, &make use of relational data in a Hadoop.
BECSE408T4	Invent the concept of identity access management , cloud security challenges and data privacy in the cloud
BECSE408T5	Build applications for cloud computing using C#.NET.
BECSE408T6	Discuss simple cloud application and invent some important cloud computing driven commercial systems such as Google Apps, Microsoft Azure and Amazon Web Services and other businesses cloud applications.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING-SEMESTER-VIII	
Name of Course: Advance Wireless Sensor Network	
Course code: BECSE409T	
	Course Outcome (The Student would be able to)
BECSE409T1	Discuss the theory behind wireless sensor networks. And Applyknowledge of wireless sensor networks (WSN) to various application areas.
BECSE409T2	Elaborate wireless sensor network fundamentals and provide hands on trainingin programming Wireless sensor networks at different platform forinterfacing hardware with software.
BECSE409T3	Discuss wireless sensor network fundamentals and provide hands on trainingin programming Wireless sensor networks at different platform forinterfacing hardware with software.
BECSE409T4	Interprete different name and addressing technique used in WSN and its different management task.
BECSE409T5	Elaborate network level protocols for MAC, routing, time synchronization,aggregation, consequences and distributed tracking.
BECSE409T6	Compare different detection and tracking approach in application support.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING-SEMESTER-VIII	
Name of Course: Project and Seminar LAB	
Course code: BECSE410P	
Sr. No.	**Course Outcome (The Student would be able to)**
BECSE410P1	Discuss the relevant knowledge and skills, which are acquired within the technical area, to a given problem.
BECSE410P2	Design roles with clear lines of responsibility and accountability.
BECSE410P3	Compile software engineering principles and also core engineering principles.
BECSE410P4	Choose different programming languages and software tools.
BECSE410P5	Adapt a strong working knowledge of ethics and professional responsibility.
BECSE410P6	Justify real world problems to Contribute in society by developing solutions.

DEPARTMENT OF ELECTRICAL ENGINEERING

SEMESTER : - III

SUBJECT :- ELECTRICAL MEASUREMENT AND INSTRUMENTATION
SUBJECT CODE :-BEELE303T

After completion of the course students will be able to:

CO1	Understand the details of different electrical instruments used for electrical measurement and Instrumentation.
CO2	Study the different Bridges used for measurement of R,L & C
CO3	Memorize the details of different types of potentiometer, CT & PT.
CO4	Interpret the Idea about transducer and measurement of acceleration, velocity, angular velocity, Torque & Power measurement.
CO5	Gathered the basic Idea about measurement of temperature using thermistor, RTD, thermocouple, two color pyrometer & Optical pyrometer.
CO6	Find various electrical parameters with accuracy, sensitivity, precision and resolution.

SUBJECT :- NETWORK ANALYSIS

SUBJECT CODE :- BEELE304T

After completion of the course students will be able to:

CO1	Identify node and loop (mesh) analysis.
CO2	Understand Phasor analysis to AC circuits in sinusoidal steady state.
CO3	Remember various Network Theorem for analyze and design of electric circuits.
CO4	Highlight periodic input to electric circuits using Fourier series and their response.
CO5	Gathered initial and final conditions for current and voltage in first and second order circuit.
CO6	Identify the response of a circuit excited by a waveform composed of various step and ramp signal.

SUBJECT :-ELECTRONIC DEVICES & CIRCUITS

SUBJECT CODE :-BEELE305T

After completion of the course students will be able to:

CO1	Understand working of basic semiconductor devices, transistors, amplifiers, FET & MOSFETS.
CO2	Study the Conversion of number from one code to other code.
CO3	Implement Logic gates and truth tables of digital circuits.
CO4	Plot current & voltage characteristics of semiconductor devices.
CO5	Define dc circuit and related ac model of semiconductor devices with their physical Operation.
CO6	Evaluate frequency response to understand behavior of Electronics circuits.

SUBJECT :-NON CONVENTIONAL ENERGY SOURCES

SUBJECT CODE :-BEELE302T

After completion of the course students will be able to:

CO1	Understand fundamental of solar radiation geometry and application of solar energy.
CO2	Locate at site for wind farm & different types of wind generators.
CO3	Highlight the basic study of small hydro, ocean & wave energy.
CO4	Study the different non-conventional sources and the power generation techniques to generate electrical energy.
CO5	Identify the need and ability to engage in lifelong learning for further developments in electrical field.
CO6	Study energy generation from non-conventional energy sources like geothermal, wind and ocean

SEMESTER :- IV

SUBJECT :-ELEMENTS OF ELECTROMAGNETICS
SUBJECT CODE :-BEELE402T

After completion of the course students will be able to:

CO1	Identify the various laws about the analysis of electromagnetic systems.
CO2	Determine the physical state for functioning of circuit elements.
CO3	Apply Electromagnetic boundary conditions.
CO4	Be familiar with the four Maxwell's equations used to study time varying electromagnetic or dynamic fields.
CO5	Understand the concept of uniform plane-wave propagation and electromagnetic power density flow in lossless medium.
CO6	Study various laws about the analysis of electromagnetic systems.

SUBJECT :-DIGITAL AND LINEAR ELECTRONIC CIRCUITS

SUBJECT CODE :-BEELE403T

After completion of the course students will be able to:

CO1	Understand the basic fundamentals of logic gates, Flip flops & timers.
CO2	Remember the basic of Operational Amplifier Circuits.
CO3	Recall the simple linear circuits.
CO4	Define the applications of Operational amplifier.
CO5	Study of Linear IC's.
CO6	Understand the basic fundamental of logic gate, Flip flop & timers.

SUBJECT :-ELECTRICAL MACHINES-I

SUBJECT CODE :-BEELE404T

After completion of the course students will be able to:

CO1	Remember the principle, construction, connections, vector grouping, operation and testing of 3-phase transformer conversion of 3-phase supply to 2-phase supply & parallel operation of 3-ph. Transformers.
CO2	Recall the principle, armature and field construction, types, operation characteristics, armature reaction, commutation, methods to improve commutation in dc generator.
CO3	Summarize the principle, types, voltage build up, performance characteristics, torque evaluation in dc motors.
CO4	Demonstrate the principle, construction, types, torque development, performance characteristics, tests to determine performance indices & parameters of equivalent circuit of 3-phase and double cage induction motors, methods of starting, speed control & braking of induction motors.
CO5	Illustrate the revolving and cross field theory, operation, characteristics, types, equivalent circuit & tests.
CO6	Understand the working, characteristics, equivalent circuit, torque, slip characteristics of split phase shaded pole motor.

SUBJECT :-**COMPUTER PROGRAMMING**

SUBJECT CODE :-BEELE405T

After completion of the course students will be able to:

CO1	Define the general information of computer and operating systems.
CO2	Demonstrate the structure of "C" program, Data types, Storage class, variables, expressions & Operators.
CO3	Study the use of arrays and sorting techniques.
CO4	Interpret the Pointer and Structures.
CO5	Study the basics of strings and arrays.
CO6	Relate the C++ concepts.
CO7	Study the Matrix operation using programming.
CO8	Explain the use of graphic tools for presentation.

SUBJECT :- **ENVIRONMENTAL STUDIES**

SUBJECT CODE :-BEELE406T

After completion of the course students will be able to:

CO1	Study Ecosystem, biodiversity and pollution.
CO2	Label the Environmental issues related with social and human population.
CO3	List and classify Biodiversity and its conversion.
CO4	Interpret and learn the effect of environment on social aspect and Human population.
CO5	Define and learn the natural resources available.
CO6	Identify the concept of insulator, types of insulator & string efficiency.

THIRD YEAR

SEMESTER :- V

SUBJECT :-ELECTRICAL POWER SYSTEM – I

SUBJECT CODE :-BEELE501T

After completion of the course students will be able to:

CO1	Utilize Modeling and representation of the system components used in power system.
CO2	Identify the concept of designing transmission line parameters.
CO3	Develop the basic concept of load flow analysis.
CO4	Analyze the elementary distribution scheme.
CO5	Identify the concept of insulator, types of insulator & string efficiency.
CO6	Represent and understand the transmission line parameters.

SUBJECT :-UTILIZATION OF ELECTRIC ENERGY

CODE :-BEELE502T

After completion of the course students will be able to:

CO1	Discover the applications for electrical heating equipments.
CO2	Examine the motive applications for fan, blowers, compressor, pumps & refrigeration using electric power.
CO3	Analyze the various types of compressors & DG sets.
CO4	Evaluate the advantages and disadvantages of electric welding.
CO5	Identify the design of illumination system using electric power.
CO6	Summaries the concept of insulator, types of insulator & string efficiency.

SUBJECT :-**ELECTRICAL MACHINE DESIGN**

SUBJECT CODE :-BEELE503T

After completion of the course students will be able to:

CO1	Identify proper material for design of a machine.
CO2	Build the design of transformer and estimate its performance characteristics as per requirement constraints specified.
CO3	Design of rotor core of Induction motor
CO4	Construct the design of overall dimensions of synchronous machines.
CO5	Identify proper material for design of a machine.
CO6	Determine the performance characteristics and cooling of transformer

NAME OF SUBJECT :-MICROPROCESSOR & INTERFACING

SUBJECT CODE :-BEELE504T

After completion of the course students will be able to:

CO1	Construct the concepts of VLSI circuit.
CO2	Study The introduction to Intel 8085A architecture.
CO3	Select Programming instructions.
CO4	Make a use of Interrupts.
CO5	Utilize the methods of data transfer.
CO6	Study the Hardware And Interface

SUBJECT :-ELECTRICAL MACHINES-II

SUBJECT CODE :-BEELE505T

After completion of the course students will be able to:

CO1	Examine the principle, construction, laying of armature and field windings, types, generation of emf, steady state and transient behavior, synchronization and parallel operation of synchronous generators.
CO2	Test for principle, construction, methods of starting of synchronous motor, its operation with variable load, operation with variable excitation, performance evaluation.
CO3	Distinguish special motors like Repulsion, Hysteresis, Reluctance, Universal and Schrage motors.
CO4	Understand the principle, construction, operation, control and application of special electric motors.
CO5	Understood the principal construction methods of starting of synchronous motor, its operation with veritable load, operation with veritable excitation, performance evaluations.
CO6	Describe special motors like repulsion hysteresis, reluctance, universal and schrage motors.

SEMESTER:- VI

SUBJECT :- POWER STATION PRACTICE

SUBJECT CODE :-BEELE601T

After completion of the course students will be able to:

CO1	Understand various terms & definitions used in generating power station
CO2	Sketch general layout of Thermal power plant and understanding its auxiliary
CO3	Present general layout of Hydro power plant and its auxiliary
CO4	Describe the basics of Nuclear Power plant and its disposal
CO5	Illustrating different excitation system for power generation and calculate tariff for different customers
CO6	Explain the need and basics of co-generation, captive power generation for sustainable development

SUBJECT :- ENGINEERING ECONOMICS & INDUSTRIAL MANAGEMENT
SUBJECT CODE :-BEELE602T

After completion of the course students will be able to:

CO1	Organize & manage the things economically after the completion of course.
CO2	Develop the entrepreneurship.
CO3	Plan for Inflation and deflation.
CO4	Analyze the material, production, personnel management.
CO5	Make use of finance and marketing management.
CO6	Manage the things economically

SUBJECT :-ELECTRICAL DRIVES & THEIR CONTROL

SUBJECT CODE :-BEELE603T

After completion of the course students will be able to:

CO1	Examine the numerical on starting, speed control and braking.
CO2	Test for numerical on heating and cooling of motors.
CO3	Model the foundation for studying the advanced subject Power Semiconductor based drives to be studied in 8th semester.
CO4	Discover the work on the drives used in the Industry.
CO5	Function with PLC's in the Industry
CO6	Develop an Insight in the working of drives used in traction.

SUBJECT :- POWER ELECTRONICS

SUBJECT CODE :-BEELE604T

After completion of the course students will be able to:

CO1	Experiment with basic operation of various power semiconductor devices.
CO2	Apply the basic principle of switching circuits.
CO3	Analyze and design an AC/DC rectifier circuit.
CO4	Analyze and design DC/DC converter circuits.
CO5	Analyze DC/AC inverter circuit.
CO6	Discover the role power electronics plays in the improvement of energy usage efficiency and the development of renewable energy technologies.

SUBJECT :- CONTROL SYSTEM – I

SUBJECT CODE :-BEELE605T

After completion of the course students will be able to:

CO1	List and model the linear systems and study the control system components specifications through classical and state Variable approach.
CO2	Categorize the time response and time response specifications.
CO3	Classify and analyze the absolute stability.
CO4	Analyze the relative stability through root locus method.
CO5	Test for frequency response tools like Bode plot and Nyquist plot.
CO6	Examine the introductory concepts of state variable approach.

FINAL YEAR

SEMESTER:-VII

NAME OF SUBJECT :- CONTROL SYSTEMS –II
SUBJECT CODE :-BEELE701T
After completion of the course students will be able to:

CO1	Justify the practical system for the desired specifications through classical and state variable approach.
CO2	Construct the design of the optimal control with and without constraints
CO3	Analyze non-linear and work with digital system and their further research.
CO4	Study Idea about optimal & discrete time control system.
CO5	Adapt the knowledge of classical controller or compensator.
CO6	Have an Idea about optimal and discrete time control system.

SUBJECT :- ELECTRICAL POWER SYSTEM – II

SUBJECT CODE :-BEELE702T

After completion of the course students will be able to:

CO1	Perceive and understand the basics of power system.
CO2	Formulate and solve problems on symmetrical & unsymmetrical fault, stability.
CO3	Evaluate the economy of operation and get familiar with types of grounding.
CO4	Choose the different methods of earthling.
CO5	Decide economic scheduling of system.
CO6	Understand the various aspects of electrical power systems such as stability, analysis of symmetrical components, various faults, economic scheduling and different methods of earthling.

Subject :-ELECTIVE I ENERGY MANAGEMENT AND AUDIT

SUBJECT CODE :-BEELE703T

After completion of the course students will be able to:

CO1	Compare present energy scenario with need of energy audit and energy conservation.
CO2	Interpret various aspects of energy audit such as planning, monitoring and implementation.
CO3	Utilised and manage electric and thermal energy in the industry.
CO4	Originate the energy action planning, monitoring and targeting.
CO5	Modify material and Energy Balance and Waste Heat Recovery.
CO6	Manage the things economically.

SUBJECT :- HIGH VOLTAGE ENGINEERING

SUBJECT CODE :-BEELE704T

After completion of the course students will be able to:

CO1	Study the breakdown mechanism in solid, liquid and gaseous medium.
CO2	Evaluate the lightening and switching over-voltages and insulation coordination.
CO3	Compile the different methods of non-destructive and high Voltage testing of apparatus.
CO4	Propose the different methods of generation and measurement of high voltage and currents in laboratory.
CO5	Discuss the testing of insulators, bushings & isolators.
CO6	Measurement and calculation of high voltage and current using different tests.

SUBJECT :-ELECTRICAL INSTALLATION DESIGN

SUBJECT CODE :-BEELE705T

After completion of the course students will be able to:

CO1	Determine the concept of load forecasting and to solve problem based on regression analysis.
CO2	Design the single line diagram with specification for electrical distribution networks for residential and commercial installations.
CO3	Develop the single line diagram with specification for distribution networks, motor, power control centers in industrial installation & design reactive power compensation.
CO4	Interpret the construction, types, selection of PVC/ XLPE cables and overhead conductors.
CO5	Propose 11kV and 33 kV substations for utility and industrial installations .
CO6	Evaluate the procedure for receipt, storage, testing and commissioning of transformers along with its accessories viz. OTI, WTI, Silica Gel Breather, MOG, and Buchholz relay etc.
CO7	Estimate the provisions for system and equipment earthlings as per IS 3043.

SEMESTER :- VIII

SUBJECT :-ELECTIVE-II EHV AC & HVDC TRANSMISSION

SUBJECT CODE :-BEELE801T

After completion of the course students will be able to:

CO1	Determine the power handling capacity of different Transmission systems.
CO2	Predict the electrostatic and electromagnetic fields & corona in EHVAC lines.
CO3	Explain the voltage control and current control systems for power flow controls in HVDC system.
CO4	Study the design parameters of AC filters as well as DC filters and Reactive power compensation.
CO5	Discuss the overall knowledge about the HVDC system such as MTDC, protection and substation layout of HVDC power plant.
CO6	Understand the various aspects of transmission system power flow control for HVAC and HVDC transmission lines, design parameters of filter and layout of HVDC power plant.

SUBJECT :-ELECTIVE-III POWER SEMICONDUCTOR BASED DRIVES

SUBJECT CODE :-BEELE802T

After completion of the course students will be able to:

CO1	Study the various drives used in the Industry.
CO2	Elaborate the working of rectifier fed dc motor drives.
CO3	Discuss the various inverters fed induction motor drives.
CO4	Study the Reluctance motor and Brushless DC motors.
CO5	Explain the non-conventional and renewable energy based drives.
CO6	Formulate The Traction drives with AC and DC .

SUBJECT:-SWITCH GEAR AND PROTECTION

SUBJECT CODE:-BEELE803T

After completion of the course students will be able to:

CO1	Elaborate the theory & application of main components used in power system protection.
CO2	Interpret the protection systems used for electric machines, transformers, bus bars & transmission lines.
CO3	Explain the theory, construction, and applications of main types of circuit breakers.
CO4	Recommend the design of protection systems needed for each main part of a power system.
CO5	Design the feasible protection systems needed for each main part of power system.
CO6	Determine all circuit breaker construction and operation of air blast, SF6 & vacuum breakers.

NAME OF SUBJECT :-COMPUTER APPLICATIONS IN POWER SYSTEM.

SUBJECT CODE :-BEELE804T

After completion of the course students will be able to:

CO1	Develop & determine Bus Impedance & Admittance matrix (required for Load flow & Short circuit Studies) by graphically, Inspection & building algorithm.
CO2	Discuss the Load flow study of a power system by Newton-Raphson & Gauss-Seidal Iterative Method.
CO3	Interpret the short circuit studies.
CO4	Estimate the transient stability by using Eulers, Modified Eulers & RK-4th order differential method.

DEPARTMENT OF ELECTRONICS AND TELECOMMUNICATION ENGINEERING

SECOND YEAR (THIRD SEMESTER)

Name of Subject :- Applied Mathematics - III

Subject Code :-

After completion of the course students will be able to:

CO1	Apply Laplace Transform & its inverse properties to solve equations & related applications.
CO2	Represent Fourier Series & Fourier Transform in both sine-cosine & exponential form for practical implementation.
CO3	Evaluate the techniques to obtain the curve that connects two given points which either maximizes or minimizes given integral in solution of boundary value problems.
CO4	Analyze function of Complex Variable to solve integration problems.
CO5	Investigate Partial differential Equations in the field of Engineering & Formulate equations.
CO6	Expand concept of Matrices & its application in engineering problems using graphically & algebraically using matrices.

Name of Subject :- Electronic Devices & Circuits

Subject Code :- BEETE302T

After completion of the course students will be able to:

CO1	Understand the relation between physical structure and circuit behavior of semiconductor devices and analysis of its applications.
CO2	Characterize the Bipolar Junction Transistor in terms of appropriate external variables and differentiate with its different biasing technique.
CO3	Identify basic circuits like small-signal ac circuit & negative feedback amplifier.
CO4	Interpret Transistor as a circuit element in applications such as oscillators and Multi - vibrators & the concept of stability in Electronics circuits.
CO5	Understand various types of power amplifiers (class-A, B, C, AB) and their applications.
CO6	Realize the Field Effect Transistor in terms of appropriate external variables and differentiate with different biasing techniques.

Name of Subject :- Electronics Measurement & Instrumentation

Subject Code :- BEETE303T

After completion of the course students will be able to:

CO1	Explain basic concept, principle, its types, characteristics& errors associated with the measuring instrument.
CO2	Understand the operation of Electronics instrument like PMMC, Galvanometer for various parameter measurement of measuring instrument.
CO3	Classify AC & DC Bridges & their applications in the instrumentation system.
CO4	Elaborate the operation of different Transducers for measurement & theirapplications for design purposes.
CO5	Explain the working of Oscilloscopes, dual beam, dual trace oscilloscope, function generators & application of CRO in the measurement circuitry.
CO6	Classify signal & wave analyzer, data acquisition, signal conditioning system & its necessity with its operation.

Name of Subject :-Object Oriented Programming & Data Structure

Subject Code :- BEETE304T

After completion of the course students will be able to:

CO1	Implement the concept of object oriented programming in any programming language.
CO2	Describe and apply principles of program design like operator, function overloading and class template for manipulation.
CO3	Describe and apply various object oriented features like inheritance, pure virtual function to solve various computing problems, the data structures and algorithms in the C++ language.
CO4	Integrate data structures and algorithms in larger programs using basic search and sort algorithms.
CO5	Code and test program by using linear and non-linear data structures like stacks, queues, linked list to solve various computing problems of moderate size.
CO6	Describe and implement algorithmic problems including Trees for solving complex program.

Name of Subject :-Network Analysis & Synthesis

Subject Code :- BEETE305T

After completion of the course students will be able to:

CO1	Understand the various Electrical Networks using mesh and nodal technique.
CO2	Compare different circuits by using different network theorems and its duality concept.
CO3	Demonstrate the series resonant and parallel resonant circuit for telecommunication system.
CO4	Remember filters &attenuators to design analog signal of active and passive filters & understand the basics of transmission lines for communication system.
CO5	Demonstrate the steady state, transfer function & transient response of Laplace transform of electrical circuits .
CO6	Formulate network function of 2- port network and pole zero configuration.

FOURTH SEMESTER

Name of Subject :- Applied Mathematics- IV

Subject Code :-

After completion of the course students will be able to:

CO1	Understand various types of numerical methods, for error correction, plays a vital role in many areas of Engineering.
CO2	Apply concept of Z-transform and its inverse for solving equations, identify its region of convergence and develop an ability to solve problems in various field of Engineering.
CO3	Understand basic knowledge of Bessel's function, Legendre's polynomial and series solutions.
CO4	Understand the concept of random variables and theory of probability& to apply probability theory for analysis of data in communication system and solve the problems.
CO5	Apply mathematical Expectations and use them to predict expected behavior of any function to calculate the mean, median, mode, range, and standard deviation for a given data set and also use method of moments and moment generating functions.
CO6	Collect and analyze the data statistically, central limit theorem & fundamentals of probability distributions and apply it to respective branch of engineering.

Name of Subject :- Power Devices & Machines

Subject Code :- BEETE402T

After completion of the course students will be able to:

CO1	Recognize the basics of different components used in Power Electronics.
CO2	Explain the working and characteristics of different power devices along with their applications in Electronic circuits.
CO3	Classify the concept of AC-DC converters which are widely used in industries.
CO4	Understand the concept of power converters likechoppers, inverters.
CO5	Infer the construction, working principle of three phase transformer and Induction motor with their starting methods.
CO6	Learn about AC /DC motors & Universal motors and their speed control methods.

Name of Subject :- Electro Magnetic Fields

Subject Code :- BEETE403T

After completion of the course students will be able to:

CO1	Understand basics of different coordinate systems and the concepts of electrostatics
CO2	Understand Current and Current density, continuity equation, and basics of magneto statics.
CO3	Derive the Maxwell's equations and elaborate the boundary conditions between different mediums
CO4	Apply Maxwell's equations for electromagnetic wave propagation and understand the behavior of uniform plane waves
CO5	List the use of waveguides for the transmission of electromagnetic wave at microwave frequencies.
CO6	Implement thebasic concepts of Radiation and Elements used for radiation along with the basic terminologies.

Name of Subject :-Digital Circuits & Fundamentals of Microprocessor

Subject Code :- BEETE404T

After completion of the course students will be able to:

CO1	Understand the fundamentals of basic logic gates and their use in combinational and sequential circuits.
CO2	Construct the different types of combinational circuits such as Adders, Subtractors, MUX, DEMUX, Encoders, Decoders.
CO3	Evaluate performance of various Flip-flops based systems.
CO4	Construct synchronous and asynchronous systems such as up/down counter, ring counter, shift register.
CO5	Make use of digital ICs to design logical circuits using various digital logic families.
CO6	Understand the Architecture of microprocessor 8085 and Instruction set which are useful for programming.

Name of Subject :- Signals & Systems

Subject Code :- BEETE405T

After completion of the course students will be able to:

CO1	List different types of signals and systems used in communication Electronics.
CO2	Describe the concept of probability and its use in communication system.
CO3	Embed the use of Fourier series and Fourier transform for feature extraction of different electronic signals.
CO4	Implement different coding schemes and apply for the various applications.
CO5	Classify analog and digital modulation schemes.
CO6	Elaborate the basics of information theory & coding.

THIRD YEAR (FIFTH SEMESTER)

Name of Subjects : Antenna & Wave Propagation

COURSE CODE : BEETE501T

After completion of the course students will be able to:

CO1	Analyse transmission line characteristics and parameters.
CO2	Calculate antenna Parameters(beam width,lobes,directivity,gain) of Linear Antenna and its ground effects and their application.
CO3	Design& analyze antenna arrays.
CO4	Explain the concept, radiation mechanism and applications of Micro strip Patch Antenna.
CO5	Classify different types of Reflector antennas, Horn antennas and analyse them.
CO6	Implement the different aspects of Antenna measurements and radio wave propagation.

Name of Subjects : Microprocessor and Microcontrollers

COURSE CODE : BEETE502T

After completion of the course students will be able to:

CO1	Learn about internal organization of Microprocessor and Microcontroller.
CO2	Explain the concept of addressing modes and timing diagram of Microprocessor.
CO3	Demonstrate the concept of 8086 & peripheral interfacing.
CO4	Implement the transmission of data using serial-parallel communication concept.
CO5	Demonstrate the concepts of interrupts and their use.
CO6	Interface 8086 & 8051 with keyboard /display, ADC/DAC, Stepper motor.

Name of Subjects :Analog Circuit & Design

COURSE CODE : BEETE503T

After completion of the course students will be able to:

CO1	Analyse the basic differential Amplifier using transistor and its operation,Op-Amp Fundamentals & its characteristic.
CO2	Design linear OP-Amp circuits such as voltage follower, summing amplifier, scaling and averaging amplifier,instrumentation amplifier circuits for various practical applications.
CO3	Design non –linear OP-Amps such as comparators, Schmitt ,multivibrator circuits , LM 339 for various practical applications.
CO4	Analyze the regulated power supply system (SMPS, Series voltage regulators).
CO5	Describe the operation of sinusoidal oscillators & function generators.
CO6	Explain the function of various filters and drivers.

Name of Subjects :Communication Electronics

COURSE CODE : BEETE504T

After completion of the course students will be able to:

CO1	Demonstrate the basic communication terms & parameters.
CO2	Describe the different types of modulation & Demodulation process & compute modulation Index and power requirement.
CO3	Formulate the quantized and PCM signals and understand their bandwidth& bit rate calculation &sampling theorem.
CO4	Describe the various types of noise &compute communication engineering problems.
CO5	Demonstrate the fundamentals of AM & FM receivers, communication receiver.
CO6	Elaborate the operation of broadband communication links & Multiplexing.

Name of Subjects : Industrial Economics & Entrepreneurship Development

COURSE CODE : BEETE505T

After completion of the course students will be able to:

CO1	Understand scope of an industrial economics and entrepreneurship development, business structure and business economics and apply this knowledge in a complex business environment.
CO2	Identify and understand market structure, economic reforms and its social impact by applying the knowledge of economics.
CO3	Comprehend the process of entrepreneurial development for setting up engineering / business unit; know sources of finance for business development.
CO4	Apply knowledge of economics and entrepreneurship with professional and ethical responsibilities
CO5	Understand application of economics and entrepreneurial know-how in multidisciplinary domains of industry.
CO6	Understand business & economic on a large scale.

SIX SEMESTER

Name of Subjects : Telecommunication Switching Systems

COURSE CODE : BEETE601T

After completion of the course students will be able to:

CO1	Describe the different types of telephone switching systems.
CO2	Explain the various aspects of telecommunication traffics.
CO3	Describe the types of Switching Networks, Grading and their application and Call processing Functions.
CO4	Explain the function of network synchronization and management.
CO5	Acquire the knowledge of various Data Networks like LANs, MANs, Fiber optic networks and Data network Standards.
CO6	Demonstrate the concept of cellular telephone.

Name of Subjects : Digital Signal Processing

COURSE CODE : BEETE602T

After completion of the course students will be able to:

CO1	Describe the basic concepts of Digital signal processing& analyse the signals for different kinds of applications.
CO2	Analyze the Z-transform of signals and systems & retrieve the information from the signals.
CO3	Represent the discrete time signal analytically & visualize them in time domain.
CO4	Design & implement IIR filters for various applications.
CO5	Design & implement FIR filters for various applications.
CO6	Elaborate the concepts of multi rate signal processing and how to apply it for wavelet transform.

Name of Subjects :Control System Engineering

COURSE CODE : BEETE603T

After completion of the course students will be able to:

CO1	Explain the fundamental concept of control system & mathematical modelling of the system.
CO2	Determine the response of different order system for various step input.
CO3	Analyze the stability of the system using Root locus, Bode plot.
CO4	Analyze the frequency response using Nyquist plot.
CO5	Recognize the compensators need & overview of various transducers with their signal conditioning system.
CO6	Apply the state variable approach in design.

Name of Subjects : Digital Communication

COURSE CODE :BEETE604T

After completion of the course students will be able to:

CO1	Acquire the knowledge of basic concepts of digital communication system.
CO2	Explain different methods of Source & Waveform Coding.
CO3	Describe various Digital Modulation techniques.
CO4	Implement the channel coding using galois field, Linear block code, Cyclic code and Convolution code.
CO5	Interpret channel coding using trellis code & turbo coding.
CO6	Describe spread spectrum analysis and its applications.

Name of Subjects : Functional English

COURSE CODE : BEETE605T

After completion of the course students will be able to:

CO1	Apply English language proficiency seamlessly in professional career & to clear the concept of grammar usage and vocabulary.
CO2	Identify the communication gaps and barriers to communicate in profession and rectify them professionally.
CO3	Write contents, prepare technical documents, legal documents, Board documents, Minutes of the Meetings, internal and external communication in a proficient English language & they also learn documentation to convey different message to different kind of audience.
CO4	To enhance reading ability and speed & understand the basic concept given in the contents & prepare students for analytical approach to English language for competitive exams like TOFEL, GRE.
CO5	Exploit the social digital media for effective corporate communication.
CO6	Unleash public speaking/ presentation skills.

FINAL YEAR (SEVEN SEMESTER)

Name of Subjects : DSP Processor & Architecture

COURSE CODE : BEETE701T

After completion of the course students will be able to:

CO1	Explain fundamental concepts and features of Processor.
CO2	Describe the detailed architecture,addressing modes,instruction sets of TMS320C5X.
CO3	Elaborate instruction set of TMS320C5X and write Programs for processing signals.
CO4	Demonstrate internal architecture, addressing modes of TMS320C54XX.
CO5	Design & implement DSP algorithm using code composer studio.
CO6	Design decimation filter and interpolation filter.

Name of Subjects : Television & Video Engineering

COURSE CODE : BEETE702T

After completion of the course students will be able to:

CO1	Describe fundamentals of television and display.
CO2	Explain the fundamental techniques of different T.V. Standards.
CO3	Demonstrate the digital TV & its compression techniques.
CO4	Elaborate Modern T.V system.
CO5	Explain Video Recording & display system.
CO6	Infer various consumer applications of Television Systems.

Name of Subjects : Optical Communication

COURSE CODE : BEETE703T

After completion of the course students will be able to:

CO1	Evaluate thebasic elements of optical fibre.
CO2	Classify the different kinds of losses, signal distortion in optical wave guides & other signaldegradation factors.
CO3	Describe the classification of various optical source materials, LED structures, LASER diodes.
CO4	Elaborate the fiber optic receivers such as PIN, APD diodes, receiver operation & performance.
CO5	Implement the analog and digital links of optical fibers.
CO6	List the use of operational principles of WDM, SONET, measurement of attenuation,dispersion, refractive index profile in optical fibers..

Name of Subjects : Advanced Digital System Design

COURSE CODE : BEETE704T

After completion of the course students will be able to:

CO1	Describe and apply VHDL development flow and Basic VHDL concepts.
CO2	Design the combinational & sequential circuit using VHDL
CO3	Develop the skills to become VLSI front end designers.
CO4	Overview of Finite state machine & design sequential circuits.
CO5	Implement the digital system i.e.HDL based synthesis,timing and power analysis.
CO6	Design programmable logic device& synthesize on FGPA/CPLD and perform experimentation on Hardware /Software co-design.

Name of Subject :- VLSI Processing (Elective-1)

Subject Code :- BEETE705T

After completion of the course students will be able to:

CO1	Implement pipelining and parallel processing for clock period minimization &\ or low power.
CO2	Perform retiming of DFG for clock period minimization.
CO3	Use unfolding algorithm for sample period reduction, parallel processing.
CO4	Use folding transform for register minimization andmultirate system.
CO5	Implement convolution using fast convolution algorithm.
CO6	Solve convolution numerical using cyclic & iterated convolution method.

Name of Subject :-Data Compression and Encryption(Elective-1)

Subject Code :- BEETE705T

After completion of the course students will be able to:

CO1	Implement various text compression techniques.
CO2	Execute various audio compression techniques.
CO3	Implement various Image and video compression techniques.
CO4	Applyvarious security techniques in communication.
CO5	Provide various authentications using digital communication.
CO6	Apply the knowledge of encryption techniques application to digital data.

EIGHT SEMESTER

Name of Subject :- Microwave And Radar Engineering

Subject Code :- BEETE801T

After completion of the course students will be able to:

CO1	Analyze the use of active microwave devices like Klystron, TWT, BWO andmagnetron.
CO2	Analyze and use different power distribution Tees and passive microwave devices using scattering parameters.
CO3	Illustrate different solid state microwave devices.
CO4	Calculate various parameters like frequency, power, attenuation, VSWR, impedance, insertion loss, dielectric constant, Q of a cavity resonator, phase shift.
CO5	Describe about Radar, identify, formulate and model problems and find Radar engineering solutions based on a system approach.
CO6	Demonstrate accession of technical competence in specialized areas of Radar Engineering.

Name of Subject :- Computer Communication Networks

Subject Code :- BEETE802T

After completion of the course students will be able to:

CO1	Describe the requirement of theoretical & practical aspect of computer network.
CO2	Interpret the switching techniques of computer networks.
CO3	Classify different wired &wireless LAN standards & hardware.
CO4	Describe various protocols and routing techniques used in network.
CO5	Elaborate various application protocols used in communication.
CO6	Retrieve the concept of computer network security and network administration.

Name of Subject :- Wireless & Mobile Communication

Subject Code :- BEETE803T

After completion of the course students will be able to:

CO1	Design a model of cellular system communication and analyze their Operation and performance.
CO2	Quantify the causes and effects of path loss and signal fading on received signal characteristics.
CO3	Analyze equalization, various polarization techniques and different diversities.
CO4	Construct and analyze the GSM system.
CO5	Demonstrate the wireless networking,Mobile IP and wireless access protocol.
CO6	Explain various wireless LAN networks technology.

Name of Subject :- Digital Image Processing (Elective -2)

Subject Code :- BEETE804T

After completion of the course students will be able to:

CO1	Explain Basic fundamentals of Digital Image Processing.
CO2	Interpret knowledge of Histogram and Filtering in Enhancement of Image.
CO3	Execute various Transform Techniques for Image Enhancement.
CO4	Apply the Coding and Compression Techniques.
CO5	Analyze the Image by Segmentation, Representation and Description.
CO6	Demonstrate the applications of image processing algorithms to real life problems.

Name of Subject:- Artificial Intelligence (Elective-2)

Subject Code:-BEETE804T

After completion of the course students will be able to:

CO1	Understand the history, development and various applications of artificial intelligence.
CO2	Analyze Propositional and Predicate logic and their roles in logic programming.
CO3	Explain the programming language Prolog and write programs in declarative programming style.
CO4	Implementknowledge representation and reasoning techniques in rule-based systems and model-based systemsbased onprobability theory .
CO5	Demonstrate Expert System, its Architecture and functionality withexample .
CO6	Classify Natural Language with Formal grammar for a fragment of English, Syntactic analysis, Augmented grammars, Semantic interpretation, Ambiguity and disambiguation &Discourse understanding.

Name of Subject :- Satellite Communication (Elective-3)

Subject Code :- BEETE805T

After completion of the course students will be able to:

CO1	Understand the working principle of satellite communication system and orbital aspects and Components of a satellite communication system.
CO2	Design and analyze the link budget of a satellite communication system and study of satellite orbits and launching.
CO3	Describe multiple access techniques in Satellite Communication.
CO4	Analyze propagation and rain effect on satellite.
CO5	Perform error correction and detection codes related to Satellite Communication.
CO6	Monitor the different components in satellite communication earth stations.

Department of Civil Engineering	
FIRST SEMESTER B. E.	
Basic Civil Engineering	
After studying this subject, the students will be able to	
C101.1	Know the scope of civil engineering in various fields and understand and describe the basic terms related to survey, planning, and construction of infrastructure.
C101.2	Understand and define the terms related to water and waste water generation and treatment
C101.3	Understand and explain the basic terms related to water resources and its management
C101.4	Understand the concept of green building and define the terms related to its rating and certification.
SECOND SEMESTER B. E.	
Engineering Mechanics	
After studying this subject, the students will be able to	
C202.1	Acquire the basic knowledge of resolution of various forces acting on the rigid bodies.
C202.2	Understand and analyze the effect of forces on the rigid bodies with the help of various laws and theories.
C202.3	Explain and draw the effect of forces on rigid bodies.
C202.4	Apply the basic knowledge obtained in engineering mechanics in solving the engineering problems.
Engineering Mechanics (Practical)	
After the conduction of practical's will be able to perform the test to:	
C202.1	Perform the test to ascertain the equilibrium of a body under various systems of forces.
C202.2	Perform the tests to understand the terminology related to simple lifting machine, friction, mass moment of inertia.
C202.3	Calculate and draw a graphical solution to problems of equilibrium.
THIRD & FOURTH SEMESTER B. E. CIVIL	
BECVE301T Mathematics - III	
After studying this subject, the students will be able to	
C301.1	The students would be able to solve numerical on Fourier Series & partial differential equations.
C301.2	The students would be apply partial differential equations in column buckling problems, behavior of structures subjected to dynamic loads and in unsteady flow problems in fluid mechanics.
C301.3	The students would be apply problems related to finite element analysis using calculus of variations
C301.4	The students would be able to analyze structures for static and dynamic loads using matrices and Eigen value.
C301.5	There are several applications of Numerical methods using computers especially in structural and Fluid Mechanics where classical solutions are tedious.
C301.6	The students would be able to optimize the recourses using simplex methods of linear programming.
BECVE302T Strength of Materials	
After studying this subject, the students will be able to	
C302.1	Understand the behavior of materials under different stress and strain conditions.
C302.2	Calculate & draw shear force and bending moment diagram for beams under loading conditions.

C302.3	Analyze the bending stress, shear stress, torsion, tension & deflection of beam under different loading conditions.
C302.4	Understand the application of torsion on different types of shafts.
C302.5	understand the moment curvature relation & find the deflection in beams.
C302.6	Evaluate principal stresses and strains.
BECVE302P Strength of Materials (Practical)	
After the conduction of practical's will be able to perform the test to:	
C302.1	Understand the concept and application of various types of strain gauges.
C302.2	Perform various tests and evaluate different engineering properties of engineering materials by performing different test on it.
C302.3	Obtain a graphical solution to SFD & BMD problems for simple beams.
BECVE303T Environmental Engineering – I	
After studying this subject, the students will be able to	
C303.1	Explain sources of water & determine variation in demand
C303.2	Understand the concept of rising main and its classification
C303.3	Understand the function of various units of water supply scheme and apply the knowledge in planning and design of water supply system.
C303.4	Have knowledge of characteristics of water, drinking water standards and necessity of treatment.
C303.5	Understand the concept of disinfection and its mechanism
C303.6	Have the basic knowledge related to generation, collection, treatment disposal of solid waste.
BECVE 303 P Environmental Engineering – I (Practical)	
After the conduction of practical's will be able to perform the test to:	
C303.1	Perform different tests to ascertain physical, chemical and biological characteristic of given water sample.
C303.2	Understand the importance of levels of BOD & COD in a waste water treatment and know various methods to determine the same.
C303.3	Understand and visualize the working of various units of Water Treatment Plant during the visit and can write a report.
BECVE304T Engineering Geology	
After studying this subject, the students will be able to	
C304.1	Understand the origin of various types of minerals & rocks and describe their fundamental properties.
C304.2	Understand and explain the terms related to structural, mineral geology and geomorphology.
C304.3	Identify and describe dip, strikes, folds and faults
C304.4	Understand the basic terms related to the earthquake and assess the safety civil engineering structures in different seismic zones.
C304.5	Apply the basic knowledge of engineering geology in assessing the suitable site for civil engineering projects like dams, tunnels.
C304.6	Understand importance of geo-hydrological and geo-physical information of area in planning the civil engineering structure.

BECVE 304P Engineering Geology (Practical)	
After the conduction of practical's will be able to perform the test to:	
C304.1	Identify the rocks and minerals based on the knowledge of its fundamental properties.
C304.2	Identify dip and strike folds and faults and can show it on the maps.
C304.3	Understand and visualize the geological phenomenon during the visit and can write a report.
BECVE305T Concrete Technology	
After studying this subject, the students will be able to	
C305.1	Have the knowledge of types, properties and role of different constituents of concrete like cement, fine and coarse aggregate, water, etc.
C305.2	Understand and explain the batching, mixing, production, transportation and placement of concrete to achieve the desired results.
C305.3	Analyze and explain the properties of fresh and hardened concrete.
C305.4	The students will acquire the knowledge and describe the strength and durability of concrete.
C305.5	Understand the properties of admixtures and describe its application in various situation and requirement in concrete construction.
C305.6	Assess the strength of concrete based on the fundamental knowledge of nondestructive testing.
BECVE 305P Concrete Technology (Practical)	
After the conduction of practical will be able to perform the test to:	
C305.1	Perform different tests on cement, coarse and fine aggregate to ascertain the properties useful in production of good concrete and do the actual mix design of concrete
C305.2	Perform the tests on hardened concrete to understand and know its compressive strength variation.
C305.3	Ascertain the quality of concrete by performing non-destructive testing of the existing concrete.
BECVE401T Structural Analysis – I	
After studying the subject, the students will be able to	
C401.1	Understand the concept of determinate and indeterminate structure.
C401.2	Understand the effect of moving load and can analyze and draw the influence line diagrams.
C401.3	Understand and apply different methods and theorems in the analysis of various structures
C401.4	Compute the effect of vertical loads on beams, columns and arches and understand the phenomenon related to it.
C401.5	Understand the concept of degree of freedom and slope deflection and can apply the knowledge in analyzing the frames.
C401.6	Understand the stress developed on column section subjected to eccentric load and moment imposed on member due to fixity of its support.
BECVE 401P Structural Analysis – I (Practical)	
After the conduction of practical will be able to perform the test to:	
C401.1	Apply the knowledge of different methods of analysis of structures to analyze the structural elements.
C401.2	Use the understanding obtained in theorems & principles of analysis of structure and verifies the same experimentally.
C401.3	Understand the working principle and use of Strain gauges and Poloriscope in structural analysis.

BECVE402T/3CE04T Geotechnical Engineering -I	
After studying the subject, the students will be able to	
C402.1	Understand the origin of soil and identify different types of soil.
C402.2	Define and determine the index and engineering properties of the soil
C402.3	Understand permeability of soil and the concept of seepage and classify its suitability in various engineering works.
C402.4	Evaluate the shear stresses and strength of the soil mass.
C402.5	Understand the concept of compressibility of soil using compaction and consolidation process.
C402.6	Understand the concept of principal stresses of soil
BECVE402P/3CE04P Geotechnical Engineering -I (Practical)	
After the conduction of practicals will be able to perform the test to:	
C402.1	Identify and classify soil based on engineering properties of soil.
C402.2	Understand and determine the density and shear strength parameters of soil of a soil using various tests
C402.3	Understand the use of different charts for classifying soil or knowing the stress under the soil.
BECVE403T/5CE04T Transportation Engineering – I	
After studying the subject, the students will be able to	
C403.1	Exhibit the knowledge of planning, design and construction practices in highway engineering.
C403.2	Acquire the knowledge of geometric design and the fundamental properties of highway materials and find appropriate conclusion.
C403.3	Understand the concept of different methods in design, construction, inspection and maintenance of the pavement.
C403.4	Apply the knowledge in planning and design of pavement and geometrics by illustrating various traffic studies
C403.5	Understand terminology related to bridge engineering and hydrological parameters of importance in bridge design.
C403.6	Understand & illustrate different sub-structures and super-structures of a bridge and its construction, inspection and maintenance.
BECVE403P/5CE04P Transportation Engineering – I (Practical)	
After studying the subject, the students will be able to	
C403.1	Understand the classification and strength parameters of sub-grade soil through various tests.
C403.2	Acquire the knowledge about different physical and engineering properties of aggregates by performing different test on road aggregates.
C403.3	Understand the various properties of bitumen material by performing various tests on it.
BECVE404T/4CE05T Surveying – I	
After studying the subject, the students will be able to	
C404.1	Understand and apply the temporary and permanent adjustments in the field survey.
C404.2	Make use of knowledge regarding various survey instruments in measuring the distances and angles and also to compute levels of different works.
C404.3	Apply the knowledge in preparing various types of maps.

C404.4	Use the knowledge to estimate the quantity (areas and volumes) of the Civil Engineering work.
C404.5	Undertake various civil engineering surveys work
C404.6	Make use of plain table survey in reproducing the site features on paper.
BECVE404P/4CE05P Surveying – I (Practical)	
After studying the subject, the students will be able to	
C404.1	Exhibit the knowledge of working and uses of various survey instruments.
C404.2	Take the measurement, record the measurement and perform the calculations by applying necessary adjustments.
C404.3	Collect the surveyed data and to compute the area traverse using various instruments.
BECVE 405 T Building Construction and Material	
After studying the subject, the students will be able to	
C405.1	Identify components of a building. classify & compare types of building materials.
C405.2	understand the types of brick mesonary , different types of brick bonds .
C405.3	Select appropriate material for building construction.
C405.4	Understand the requirement of various building components and take-up the planning, design and construction related activities with their quality control.
C405.5	Select, plan and provide the suitable types doors and window at appropriate locations.
C405.6	Select suitable type of formworks, scaffolding and shoring under different work conditions.
FIFTH & SIXTH SEMESTER B. E.	
BECVE501T Structural Analysis -II	
After studying this subject, the students will be able to	
C501.1	Understand the concept of basic terminologies related to structural analysis.
C501.2	Apply the methods of analysis of frames in practical problems by MDM and Kanis's method .
C501.3	Formulation of stiffness matrix, transformation matrix, and load matrix for truss element .
C501.4	Formulation of stiffness matrix, transformation matrix, and load matrix for beam element .
C501.5	Formulation of stiffness matrix, transformation matrix, and load matrix for portal frame element .
C501.6	Understand the basics concepts of finite element method & structural dynamics .
BECVE501P Structural Analysis -II (Practical)	
After the conduction of practicals will be able to perform the test to:	
C501.1	Apply practical knowledge of structural software, in analysis and design of structural components.
C501.2	Understand basics of stiffness matrix, for the evaluation of displacement, moments etc.
C501.3	Apply the knowledge into evaluation of appropriate solution to engineering problems with the help of software and modern tools.
BECVE502T Reinforced Cement Concrete Structures (RCC)	
After studying this subject, the students will be able to	
C502.1	Classify the basic concept of working stress method and limit state method.
C502.2	Understand the basic concepts of structural design Methods of RCC to the practical problem
C502.3	Understand the composite action of reinforced steel and concrete in reinforced concrete structural members

C502.4	Use the knowledge of the structural properties of materials i.e. steel and concrete in assessing the strength.
C502.5	Use the knowledge in structural planning and design of various components of buildings.
C502.6	Apply the concepts and applications of prestressed concrete in real problems
BECVE502P Reinforced Cement Concrete Structures (RCC) (Practical)	
After the conduction of practicals will be able to perform the test to:	
C502.1	Apply the knowledge in actual structural design for various buildings.
C502.2	Make use of structural design knowledge in reading and understanding the professional RCC drawing and draw an appropriate conclusion.
C502.3	Understand the implementation of working drawing and write a report during the visit to any construction site.
BECVE503T T Fluid Mechanics-I (Theory)	
After studying this subject, the students will be able to	
C503.1	Measure and determine fluid pressures and forces on plates/surfaces, pipe bends, etc.
C503.2	Apply the principles of hydrostatics and determine the forces
C503.3	Apply the Bernoulli's equation to solve the problems in fluid.
C503.4	Understand the basic concepts related to laminar and turbulent flow
C503.5	Apply the knowledge of various instruments in flow measurement & its control
C503.6	Understand the concepts of dimensional analysis use the dimensionless number suitably also Understand the basic concepts related to laminar and turbulent flow
BECVE503 P Fluid Mechanics-I (Practical)	
After the conduction of practicals will be able to perform the test to:	
C503.1	Determine the discharge of Venturimeter , Orifice meter, Rectangular Notch, Triangular Notch
C503.2	Determine the coefficient of velocity and the coefficient of contraction of the orifice and mouth piece.
C503.3	Knowledge of laminar flow, turbulent flow & Reynolds number
BECVE504T Geotechnical Engineering -II	
After studying this subject, the students will be able to	
C504.1	Use the knowledge of different soil exploration techniques to ascertain the properties of soil
C504.2	Analyze the stability of natural slopes, safety & sustainability of the slopes ,design of retaining structures, reinforced earth walls, etc.
C504.3	Determine active earth pressure and Explain different earth pressures
C504.4	Implement the Practices of Ground Improvement Techniques.
C504.5	Design the shallow foundation.
C504.6	Design the pile foundation.
BECVE505T Hydrology & Water Resources	
After studying the subject, the students will be able to	
505.1	Use of knowledge of basics of hydrology in calculating infiltration, evaporation, total runoff
505.2	Use the techniques of the Hydrographs to forecast flood discharge at various durations.

505.3	Apply the Statistical techniques to analyze the flood occurrence & frequency.
505.4	Use the knowledge pertaining to the flood to plan flood routine & emergency plans
505.5	Apply the knowledge of geo-hydrology terms in planning, assessing & computation of ground water potential and its assessment using various techniques.
505.6	Take-up planning of water resources mini project.
BECVE506P Communicative English & Technical Writing	
After studying this subject, the students will be able to	
C506.1	Use functional grammar
C506.2	Write at work, draft reports and letters
C506.3	To understand the planning and procedure of carrying out research work
C506.4	Dexterous in presentation skills and participate in GD
BECVE601T Steel Structures	
After studying this subject, the students will be able to	
C601.1	Apply the knowledge of structural properties in assessing its strength for the construction purpose.
C601.2	Analyze the steel structural components by using various techniques.
C601.3	Make use of understanding and knowledge of analysis in structural planning and design of various buildings components.
C601.4	Analyze & design of various composit column structure , built up column with suitable knowledge of lacing and battening conncetion .
BECVE601P Steel Structures (Practical)	
After the conduction of practicals will be able to perform the test to:	
C601.1	Able to calculate axially loaded member by tensions and compression members.
C601.2	Design of connection: Beam to beam, beam to column.
C601.3	Design of column & its components.
BECVE602T/5CE01T Surveying-II	
After studying this subject, the students will be able to	
C602.1	Carry forward the concepts of basic surveying techniques
C602.2	Set out cuves using simple circular,combine,reverse and vertical curve method
C602.3	Set out cuves using transitin curve method
C602.4	Use geodetic and triangulation techniques in various surveying problems
C602.5	Understand and make use of various photography surveys in drawing appropriate conclusion.
C602.6	Apply the concepts of modern surveying techniques & instrumentation.
BECVE602P/5CE01P Surveying-II (Practical)	
After the conduction of practicals will be able to perform the test to:	
C602.1	Learn the importance of errors and precisions during the survey work.
C602.2	Handle & record measurement on instruments used in various types of surveying.
C602.3	Carry out detailed survey of an area using appropriate technique and draw topological features on the sheet.

BECVE603T Fluid Mechanics -II	
After studying this subject, the students will be able to	
C603.1	Understand the concepts related to boundary layer theory and determination of drag and lift forces.
C603.2	Apply the knowledge of theories, equations of pipe flow in analyzing, designing the pipe network systems and its components including water hammer pressures.
C603.3	Use the concepts of uniform and critical flow through open channels including design of efficient channel sections.
C603.4	Make use of specific energy concepts in the analysis of open channel flow.
C603.5	Understand the different techniques of dimensional analysis and its use in model testing.
C603.6	Understand and apply basic knowledge related to Turbines & Pumps in Water Resources planning.
BECVE603P Fluid Mechanics -II (Practical)	
After the conduction of practicals will be able to perform the test to:	
C603.1	Perform experiments to know and verify basic terminology related to fluid mechanics.
C603.2	Perform experiment to find out various hydraulic parameters for an open channel flow.
C603.3	Perform experiment on different turbines and pumps to understand its working and operational terms related to them.
BECVE604P Building Design and Drawing (Practical)	
After the conduction of practicals will be able to perform the test to:	
C604.1	Understand building bye laws & building code
C604.2	Apply the principles of building planning and design.
C604.3	Make use of knowledge to give layout on the field as per the plan..
C604.4	Understand the drawings and detailing of Building services
C604.5	Draw simple perspective drawings.
C604.6	To draw submission/working drawing using suitable software.
BECVE605T/5CE02T Environmental Engineering-II	
After studying this subject, the students will be able to	
C605.1	Use the technical terms related to water & its quality, sewage, sewer, storm water ,etc. in its hydraulic Design, construction, testing and maintenance.
C605.2	Explain construction of sewer,and Explain appurtenances,sewage pumping
C605.3	Understand and characterize the waste water sample in terms of its physical & chemical characteristics.
C605.4	Take-up the work functional planning, layout and design of components of Water Treatment and Sewage Treatment Plants.
C605.5	Prepare the plan for rural sanitation provisions, perform functional design of septic tank,
C605.6	Make use of knowledge and effect of air pollution, solid waste in planning for its prevention and control.
BECVE606P Site Visit & Mini Project (Practical)	
After the conduction of practicals will be able to perform the test to:	

C606.1	Get an idea of various project details such as contracts, layout, planning, drawing, estimates, Arbitration provision, licensee & licensor ,architects, structural designer, etc
C606.2	Get an idea of various construction equipment, manpower & techniques used at site, techniques of batching, mixing, transportation and placement of different construction materials.
C606.3	Get an overview on safety measures, basic amenities to provide, inventory control.
C606.4	Write a legible, correct and technically sound report after the visit.
C606.5	Ascertain the provisions and execution as per the working drawing.
SEVENTH & EIGHTH SEMESTER B. E. CIVIL	
BECVE701T Advanced Concrete Structures	
After studying this subject, the students will be able to	
C701.1	To analyse and design of different component of rectangular water tank
C701.2	To analyse and design of column and isolated footing
C701.3	To using moment distribution method analyse and design different types of beam
C701.4	To using limit state method design retaining wall
C701.5	To analyse and design different types of staircase and portal frames
C701.6	Design different types of footing
BECVE701P Advanced Concrete Structures (Practical)	
After the conduction of practicals will be able to perform the test to:	
C701.1	Analyze and design various concrete member of structure.
C701.2	Understand the relevant software and use the same in analysis & design of concrete members.
C701.3	Can write a report of visit to a site of concrete construction
BECVE702T/8CE02T Estimating and Costing	
After studying this subject, the students will be able to	
C702.1	Prepare the preliminary estimate for administrative approval & technical sanction for a civil engineering project.
C702.2	Understand and write the specification of the works to be undertaken, prepare the tender & contract documents and make use of knowledge of different contract submission & opening in awarding the work to the contractor.
C702.3	Use & execute the concept of SD, EMD, MAS, Running Bill, Final Bill during the entire project
C702.4	Prepare the bar bending schedule & also be able to find the quantity of steel
C702.5	Use the technique of Rate analysis in estimating the exact cost of material & manpower and hence the entire project.& finding the rate per unit.
C702.6	Prepare the estimate the bill of quantities using different techniques of preliminary & detailed estimation of buildings & roads
BECVE702P/8CE02P Estimating and Costing (Practical)	
After the conduction of practicals will be able to perform the test to:	
C702.1	Prepare preliminary estimates and detailed estimate of the each item of the project using appropriate method and perform the rate analysis of materials and manpower to obtain exact cost of the project.

C702.2	Use the knowledge in drafting the Specification, tender notice, contract proposal, etc and prepare the bill of quantities for the project.
C702.3	Understand the term depreciation and methods of calculating it and make use of it in valuation of the building or commodity.
BECVE703T Air Pollution And Solid Waste Management (Elective-I)	
After studying this subject, the students will be able to	
C703.1	Understand different aspects of air pollutants, its sources and effects on man and materials
C703.2	Acquire the knowledge of meteriological parameters and concept of air sampling to reduce the impact of air pollution on environment.
C703.3	understand the air pollution control methods and equipment , automobile exhaust effulent gases . Understand the noice pollution & there control measure .
C703.4	Achieve the knowledge of classifying, collection, transportation of solid waste.
C703.5	Understand the different methods of processing of solid waste and control of its by-products
C703.6	Achieve the knowledge of disposal techniques of solid waste.
BECVE704T/5CE06T Construction Management & Law/Project Management	
After studying this subject, the students will be able to	
C704.1	Demonstrate the understanding of various types of projects, modern construction techniques and will exhibit the knowledge in construction planning, scheduling and various controls.
C704.2	Exhibit the understanding in Network Analysis using CPM & PERT
C704.3	Achieve the knowledge regarding planning, allocation, utilization, operation and costing of the resources, manpower and tools & plants for any construction projects.
C704.4	Implement the quality control aspects in planning & management, modern trends project management, application of information system in management of construction projects, safety provisions and equipments.
C704.5	Understand the legal aspects in construction projects through the understanding of various laws pertaining to civil engineering and architectural planning & sanctioning, labor & organizational welfare measure, provisions of arbitration and litigations.
C704.6	Understand the provisions of different Acts pertaining to The Environment, Forest, Water & Air Pollution for any construction activity to be undertaken.
BECVE705T/7CE03T Transportation Engineering - II	
After studying this subject, the students will be able to	
C705.1	Understand the functions of various elements of railways.
C705.2	Plan and design various elements of railways and railway yard.
C705.3	Acquire knowledge of principles of traffic control in railways, airports and tunnels.
C705.4	Understand requirement, design and construction of permanent way, runway, taxiways, & tunnels.
C705.5	Achieve the understanding in the maintenance of various elements of railways, airports and tunnels.
C705.6	Know the modern tools and techniques used in construction and the maintenance of various elements of tunnels.

BECVE706P Industrial Case Study and Project Seminar	
After the conduction of practicals will be able to perform the test to:	
	Industrial Case Study
C706.1	Get exposed to the Civil Engineering Works in the industry and learn the practical aspects of the same.
C706.2	Write the detailed report on understanding achieved related to project planning, design, construction, and management.
C706.3	Can correlate the academic and industry based on understanding achieved during the exposure in the industry.
	Project & Seminar
C706.4	Understand the importance and role of literature available and can draw appropriate conclusion after reviewing the literature.
C706.5	Formulate the Aim and Objective of the project based on the literature survey
C706.6	Write the report and prepare the presentation and deliver the content of the work done in the project.
BECVE801T Irrigation Engineering	
After studying this subject, the students will be able to	
C801.1	Understand the methods and efficiencies of irrigation, crop water requirement.
C801.2	Acquire the knowledge in planning, design and operation of storage reservoir and make use of it in the practical situation.
C801.3	Understand the basic profile of dams and use the knowledge in checking stability of various types of dams
C801.4	Detail study of different components of spillway and diversion head works
C801.5	Know the theories of Canal design and apply the concept to design lined and unlined canals and detailed out the cross sections.
C801.6	Solve water logging problems and provide the appropriate solution to it.
BECVE802T Pavement Analysis And Design (Elective-II)	
After studying this subject, the students will be able to	
C802.1	Understand the characteristics & structural action of different types of pavement.
C802.2	Understand and evaluate the various parameters important for the design of flexible and rigid pavement.
C802.3	Analyze and design Flexible pavement and under different loading conditions using various techniques.
C802.4	Analyze and design Rigid pavement and under different loading conditions using various techniques.
C802.5	Propose a framework for pavement management system.
C802.6	Acquire the knowledge of pavement testing and evaluation and make use of it in strengthening, repairs, maintenance and rehabilitation of pavements.
BECVE803T Water And Waste Water Treatment (Elective - III)	
After studying this subject, the students will be able to	
C803.1	Understand the composition of typical municipal solid wastes, their sources, collection, treatment and disposal.
C803.2	Attain the ability to use the techniques, skills, and modern engineering tools necessary for environmental engineering practices.
C803.3	Analyze the stages and process of waste water treatment

C803.4	Use and working of various units of water treatment plant.
C803.5	Make use of the knowledge related to WTP in the design of different units of water &waste water treatment plant.
C803.6	Acquire the knowledge of recent development in water & waste water treatment .
BECVE803P Water And Waste Water Treatment (Elective - III) (Practical)	
After the conduction of practicals will be able to perform the test to:	
C803.1	Know various water and waste water parameter.
C803.2	Perform various tests on different samples of water and waste water to ascertain the presence of impurities so as to evaluate the quality of water.
C803.3	Make use of the knowledge to Design individual units of a WTP.
BECVE804T Construction Economics and Finances	
After studying this subject, the students will be able to	
C804.1	Acquaint with various economic and financial aspects of construction industry
C804.2	Understand the tools and techniques of economic analysis for improving their decision making skills.
C804.3	Understand the knowledge of economics and finance with special reference to construction industry.
C804.4	Understand the concept of IRR, turnkey construction projects
C804.5	Apply knowledge of inflation, recession, financial ratios.
BECVE805P Project	
After the conduction of practicals will be able to perform the test to:	
C805.1	Understand the collection and analysis of data related to project work and apply the knowledge in actual work of the project
C805.2	Present the results obtained and write the inference of the results with scope of the work.
C805.3	Write the report and prepare the presentation and deliver the content of the work done in the project.

Department of Mechanical Engineering	
BE ME- III T Applied Mathematics – III	
	The course will prepare student
CO301.1	To identify Laplace transforms & inverse Laplace transforms of various types of function, its properties and apply it to solve differential equation and are able to use in engineering Problems.
CO301.2	To work out the Fourier series representation of a periodic function in both exponential and sine-cosine forms and to solve partial differential equation and use Fourier transforms and its inverse in practical applications
CO301.3	To find extreme values of functional using Euler's eq. and also apply knowledge to solve Isoperimetric problems and boundary value problems
CO301.4	To understand analytic function of a complex variable and are able to apply Cauchy integral theorem and residue theorem to solve contour integrations.
CO301.5	To solve Lagrange's form and linear Homogeneous equation of Higher order with constant coefficient. They can apply method of separation of variable for solving P.D.E. in various engineering problems and also in Laplace transforms
CO301.6	To determine Eigen values and eigenvectors and the solution of linear differential equation using matrix method and student apply concept of matrices and its application for solving engineering problems
BE ME 302T KINEMATICS OF MACHINE	
	The course will prepare student
CO302.1	To Remember the Basic concepts of mechanism, Kutzbatch criterion, Grubler's criterion, Inversions of Kinematic chain, Degree of Freedom problems & various types of mechanism
CO302.2	To Study the Quantitative kinematic analysis of mechanism, Coriolis component of acceleration, Instantaneous center method.
CO302.3	To Understand the Concepts of cam & follower, Synthesis of cam for different types of follower motion
CO302.4	To Understand the Motion transmission by toothed wheels, gear tooth terminologies, interference & undercutting, epicyclic gear train.

CO302.5	To Study the Synthesis of mechanism by graphical method, Freudenstein's equation
CO302.6	To Understand the Concept, types, working & problems on clutches & brakes, Laws of friction.
BE ME 303T FLUID MECHANICS	
	The course will prepare student
CO303.1	To know the Various proportion of fluid, types of fluid continuity equation Cartesian co-ordinates
CO303.2	To study the Hydrostatic low, pascal law, total pressure on different surfaces and stability of floating and submerged bodies
CO303.3	To understand the Dynamics of flow and various application of Bernouli's equation
CO303.4	To study the Laminar and Turbulant flow and methods of dimensional analysis
CO303.5	To know the Flow through pipes and power transmission through pipes
CO303.6	To understand the Boundary layer concept and flow around Immersed Bodies
BE ME 304T MANUFACTURING PROCESSES	
	The course will prepare student
CO304.1	To study the importance of manufacturing processes, techniques of pattern making & molding with its properties
CO304.2	To Understand the Gating system used for sand casting process along with detailed review of different types of melting furnaces and special casting processes
CO304.3	To Understand the Concept of joining process, welding process and its types, defects and application

CO304.4	To Understand the Forming process for metals, mechanics of forming process along with different types of rolling equipments
CO304.5	To Understand the Press working process along with its classification, types and terminology. Different types of dies and introduction to shaping operation.
CO304.6	To Know the plastics, its types, applications, forming and shaping of plastics along with different techniques used for joining of plastics
BEME305T ENGINEERING METALLURGY	
	The course will prepare student
CO305.1	To understand the atomic structure of metals, imperfections, mechanism of plastic deformation, various ferrous & non ferrous alloys
CO305.2	To remember the Binary equilibrium diagrams, solid solutions, Iron-Iron carbide diagram, invariant reactions.
CO305.3	To remember the Time-temperature transformation curves and heat treatment processes and surface hardening
CO305.4	To remember the Alloy steels, Tool steels, Effect of alloying elements on properties of steels and stainless steels.
CO305.5	To remember the Cast iron, their types, alloy cast iron, on ferrous alloys, brasses and bronzes
CO305.6	To Understand the Non destructive Testing, ultra sound, die penetration test, radiography test, powder metallurgy, process and applications..
BEME306P MACHINE DRAWING	
	The course will prepare student
CO306.1	To Remember the Drawing standards for drawing sheets, name blocks, lines, section dimensioning

CO306.2	To Understand Orthographic projections of elements, sectional views, missing views, profiles
CO306.3	To Study the qualitative selection of type/size and standard practices for threads, bolts, nuts, keys.
CO306.4	To Understand the Principles of assembly and dismantling, fit and tolerances.
CO306.5	Study of some standard assemblies.
CO306.6	To Remember Production drawing name plates, part list, revisions etc.
BE ME 307P TECHNICAL REPORTS & SEMINAR	
C307.1	Students will be able to familiarize themselves with new technical topics and can participate in technical seminars and paper contests. Students will learn to collect various technical information's from different types of literature surveys like reference books, hand books, journals, internets, etc
BEME 401T APPLIED MATHEMATICS – IV	
	The course will prepare student
CO401.1	To understand numerical method to solve algebraic, transcendental and system of simultaneous linear equation
CO401.2	To understand numerical method to get solution of differential equation by using series solution and should able to solve differential equation by using Computer programming.
CO401.3	To find the Z- Transform, inverse Z- Transforms of a sequence , identify its region of convergence and develop an ability to solve problems in various branches of Engineering
CO401.4	To understand solution of differential equation by using series solution.
CO401.5	To understand Probability Theory and use it for analysis of data.

CO401.6	To understand Random Process and Special Probability Distributions.
ME 402T ENGINEERING THERMODYNAMICS	
	The course will prepare student
CO402.1	To Understand the Basic concept of thermodynamics, gas law and conversion of heat into work or vise versa.
CO402.2	To Understand the First law of thermodynamics apply to different equipments
CO402.3	To Understand the Second law of thermodynamics, concept of entropy and availability.
CO402.4	To study the Properties of steam, work and heat transfer during various thermodynamics steaming process
CO402.5	To Understand the Thermodynamics vapors power cycle and methods to increase efficiency
CO402.6	To Study the Work done and efficiency analysis of different air-standard cycle
BE ME 403T HYDRALIC MACHINE	
	The course will prepare student
CO403.1	To study the Basic concept of compressible flow and impact of jet
CO403.2	To understand the Elements of Hydroelectric power plant, impulse turbine and their design parameters, performance characteristics.
CO403.3	To study the Reaction turbine, Kalplan Turbine and their performance characteristics.

CO403.4	To study the Hydrodynamic pump their application and their design and performance characteristics.
CO403.5	To understand the Positive displacement pump, their basic principal and other miscellanies pump.
CO403.6	To Know the Model testing of hydraulic machines and other water lifting devices
BE ME 404T MACHINING PROCESSES	
	The course will prepare student
CO404.1	To introduce with machining parameters, theory of metal cutting along with its types, mechanism and types of chip formation.
CO404.2	To introduce with construction, types, applications and operations of lathe machine.
CO404.3	To study the specification, types, mechanism and application of shaper, slotter etc.
CO404.4	To understand the specifications, types and mechanisms of milling machine along with various operation.
CO404.5	To know the Grinding operations specifications, types of grinding machines along with different super finishing processes.
CO404.6	To introduce, classification, applications and operation of drilling, riming and boring machines respectively.
BE ME 405T MECHANICS OF MATERIAL	
	The course will prepare student
CO405.1	Understand the Basic concept of simple stresses and longitudinal stresses and strain.

CO405.2	Create Shear force and bending movement diagram and simple and shear stress in beam.
CO405.3	Determine the Deflection of beam and principle stresses and strain in beam.
CO405.4	To study Torsion in shaft for various loading condition and failure of column and struts for various end condition using different theory.
CO405.5	To identify the Concept of fracture and strain energy under different types of loading.
CO405.6	Explain factor of safety using different theory of failure under various criteria.
BE ME 406T ENVIRONMENTAL STUDIES	
	The course will prepare student
CO406.1	To Remember the Definition, scope and importance, Need for public awareness - Institutions in environment, people in environment. Renewable and non-renewable and associated problems;
CO406.2	To understand the Ecosystems, Energy flow in the ecosystem - water, carbon, oxygen, nitrogen; and energy cycles, integration of cycles in nature. Ecological succession; Food chains, food webs and ecological pyramids; Ecosystem types -characteristic features, structure:, and functions of forest, grassland, desert and aquatic ecosystems.
CO406.3	To Understand the biodiversity, species and ecosystem levels Bio-geographic classification of India Value of biodiversity
CO406.4	To Remember the Definition, Causes, effects and control measures of air, water, soil, marine, noise and thermal pollutions and nuclear hazards. Solid waste management - Causes, effects and control measures of urban and industrial waste. Role of individual and institutions in prevention of pollution. Disaster management Floods, Earth quacks, Cyclone and land slides.
CO406.5	To Remember the Social Issues and the Environment
CO406.6	To study the Human Population and the Environment

ME 407P MINI PROJECT	
CO407.1	During this course, student will learn regarding fabrication/construction of a simple mechanical or electro-mechanical working model using various manufacturing processes. Students will be able to familiarize themselves with new technical topics and can participate in technical seminars and paper contests
BE ME 501T INDUSTRIAL ECONOMICS AND INDUSTRIAL DEVELOPEMENT	
	The course will prepare student
CO501.1	To Understand the Basic concepts of Industrial Economics,its classification,Law of demand & various concept srelated to demand.
CO501.2	To Understand the Various factors of production,Polices of firm & industry,Cost concepts & Methods of Depreciation.
CO501.3	To study the Inflation & its effects,Direct & Indirect taxes,Types of Competition,Share Market & its terminologies.
CO501.4	To Understand the Innovation,creativity,etc.Concepts,development,IPR,Patent & Laws related to Patents.
CO501.5	To Remember the Concept & relations of Entrepreneurship,Entrepreneur,Growth affecting factors,various theories,Women Entrepreneurship & role,setup procedure & polices of SSL
CO501.6	To Understand the Preparation of project report,market survey & latest SSI schemes of DIC.
BE ME 502T DESIGN OF MACHINE ELEMENTS	
	The course will prepare student
CO502.1	To remember Machine Design and To Analyze & Evaluate Cotter Joint, Knuckle Joint, Riveted joints.
CO502.2	To Evaluate Bolted Joint and Pressure Vessels.

CO502.3	To Evaluate Shaft Design and Spring Design.
CO502.4	To Evaluate Power Screws and Clutches & Brakes.
BE ME 503T ADVANCED PRODUCTION PROCESSES	
	The course will prepare student
CO503.1	To Study the Different types of non-conventional machining processes and its applications in industry
CO503.2	To Remember the Advanced joining processes,its classification and applications in industry.
CO503.3	To Understand the Advance machining processes,its classification and applications in industry.
CO503.4	To Understand the Die cutting operations,equipments for sheetmetal working
CO503.5	To Study the Principle of jig and fixtures its classification and applications in industry
CO503.6	To Study the Principle of superfinishing processes,advantages and disadvantages and application of LASER in surface modification
BE ME 504T HEAT TRANSFER	
	The course will prepare student
CO504.1	To remember & understand different modes of Heat Transfer, Laws of Heat Transfer and Steady State Heat Transfer.
CO504.2	To apply concept of unsteady state heat conduction and heat transfer through extended surfaces.

CO504.3	To understand the principle of convection and Empirical and practical relations for forced convection.
CO504.4	To remember and understand of empirical all practical relations for free convectiona1 systems.
CO504.5	To Apply the concept of radiation heat transfer with and without radiation shield.
CO504.6	To Analyze heat exchanger equipments
BE ME 505T MECHANICAL MEASUREMENT AND METROLOGY	
	The course will prepare student
CO505.1	To understand the Basic concept of measuring system and generalized model of system elements and calibration.
CO505.2	To study the Measurement of linear and angular displacement,speed,load,force,torque & power without analytical treatment.
CO505.3	To study the Measurement of pressure,vacuum,sound,light and temperature without analytical treatment.
CO505.4	To understand the Basic concept of standards of measurement,requirement of interchangeability ,measurement of straightness & flatness.
CO505.5	To Study Limit,fit & tolerance analysis. Design of limit gauge & process planning sheet.
CO505.6	To understand the Use of comparators,optical profile projector and measurement of screwthread & geartooth.
BE ME 506T COMPUTER APPLICATIONS 1	
COME 506.1	The programs for numerical methods and for problem solving in the area of Mechanical Engineering.

COME 506.2	The concept of OOP sand will ge tintroduced with mathematical software.
BE ME 507T INDUSTRIAL VISIT	
COME 507.1	Layout of industry.
COME 507.2	Information about various department of industry.
COME 507.3	Interacted with various machine,manufacturing processes and techniques use in industry
BE ME 601T ENERGY CONVERSION 1	
	The course will prepare student
COME 601.1	To Study the plant process,Boiler and its mountings and accessories
COME 601.2	To remember the Draught classification and its Analysis,Performance of steam generators.
COME 601.3	To Study the various Fluidized bed boiler and working principle of Cogeneration plant.
COME 601.4	Study and analyze the working principle of Nozzles and Steam turbines.
COME 601.5	To analyze steam turbines
COME 601.6	To study and analyze Steam condensers.
BE ME 602T CONTROL SYSTEMS ENGINEERING	

	The course will prepare student
CO602.1	To Study the Control System components and mathematical modeling of control system
CO602.2	To understand Transfer Function system Representation through Block Diagram and Signal Flow Graph.
CO602.3	To learn System Response & Time Domain Response Analysis.
CO602.4	To understand Control system analysis, root locus, concept and types of stability.
CO602.5	To study Frequency Domain analysis, Bode & Polar plot.
CO602.6	To understand State spacer presentation of Continuous Time systems.

BE ME 603T OPERATIONS RESEARCH

	The course will prepare student
CO603.1	To Learn speed/ torque characteristics of common drive motor and analyze behavior of electric motor during starting, running, and breaking.
CO603.2	To understand the Transportation model Solution by MODI method,Assignment model,Traveling salesman problem,Branch and bound techniques.
CO603.3	To study and analyze Game theory,Criteria and optimal strategy mx2,2xngame methods,Sequencing modeI,n-job 2 machine,n-job3 machine,2job machine problems,inventorymodels,AnalysisofInventorymodelABCanalysis.
CO603.4	To understand Network model,Formulation of network,CPM & PERT analysis, cost analysis, concept of crashing.
CO603.5	To study Replacement model, Replacement of items that fails suddenly, Group replacement.

CO603.6	To study Queuing theory,M/M/I model,Simulations concept and application in waiting line simulations
BE ME 604T	**MECHATRONICS**
	The course will prepare student
CO604.1	To understand Scope,elements and design process of mechatronics,requirement,types of control system,its classification,example of mechatronics system.
CO604.2	To understand the Concept of data acquisition system,1/0 hardware and software at the microprocessor,analog to digita land digital to analog conversions,components of interconnections,concept of impedence matching and SCAOA,introduction to electronic interface subsystem, introduction,working and applicatios of microelectromechanical system.
CO604.3	To study the Review of mechanical actuating system,concept,types and elements of electrical actuating system and pneumatic and hydraulic actuating system and its applications.
CO604.4	To understand the Concept of digital logic,its applications,introduction to various components.
CO604.5	To remember the basic structure,principle of operation,programming language and applications of PLC control
CO604.6	To remember the Introduction,development,benefits and applications
BE ME 605T	**DYNAMICS OF MACHINE**
	The course will prepare student
CO605.1	To understand the Concepts of machine element dynamics,D'Alembert Princple,Concept of Precession,Gyroscopic Couple & Gyroscopic effect on airplane,ship & vehicle.
CO605.2	To learn the Dynamic force analysis of linkages by graphical method,virtual work method,Cam
CO605.3	To understand the Balancng of rotating masses,balancing of reciprocating mechanism.

CO605.4	To study the Fluctuation of energy of Flywheel,Flywheel selection,turning moment vs. crank angle diagram,Concept,types,working & characteristics of Governor.
CO605.5	To solve the Derivation of equation of motion for vibratory system,free vibraton of single degreeof freedom
CO605.6	To understand free damping with & without damping.Logarithmic deacreament,Forced vibraton of single degree of freedom system,vibraton Isolation,whirlng of shaft & critcal speed of rotors.
BE ME 607T COMPUTER APPLICATIONS II	
CO607.1	The concept and meaning of DBMS and also its industrial applications.
CO607.2	The Entity Relationship Model and will be able to design ER database scheme.
CO607.3	The basics of SQl and DDL alongwith modification of the database
BE ME 701T INDUSTRIAL ENGINEERING	
	The course will prepare student
CO701.1	To Develop the Productivity, its importance and tools & techniques for improvements of productivity, concep and practical application of method study, motion study.
CO701.2	To Design the Work measurement techniques, various tools for work measurement work sampling, Estimation of time required for completion of any activity or job. Involvement of Human in Engineering, Man machine concept, design of environment, system, work place etc.
CO701.3	To Design the Forecasting and its various methods.
CO701.4	To Develop the Maintenance, their types, Reliability, maintainability, failure data analysis.
CO701.5	To Design the Quality control, various tools for quality control, Characteristics, sampling concepts, its significance and various sampling plans.
CO701.6	To Design and Develop the Statistical Quality Control, Quality Planning, assurance, audit and Philosophy of quality improvements.
BEME702T3 AUTOMOBILE ENGINEERING	
	The course will prepare student

CO702.1	To understand the Basic concept of layout of chassis and its main component, frame, rigid vehicle. Various type of engine used in automobile their fuel supply system cooling 7 lubricating system.
CO702.2	To study the Necessary requirement & type of clutches system & transmission
CO702.3	To study and analyze Various types of transmission system & components. Necessity and type, working of breaks.
CO702.4	To understand the Principle of steering & various terminology used in steering system, working & function of suspension system
CO702.5	To understand the Working & various methods of testing & charging of electrical system and ignition system. Various concept used in wheels & tyres.
CO702.6	To study the Safety consideration, modern development in automobile
BEME702T4 POWER PLANT ENGINEERING	
	The course will prepare student
CO702.1	To analyze the Sources of energy and power, Indian energy scenario with various terms and definition in fluctuating loads and its effect. Economics in power plant and its scheduling.
CO702.2	To understand the Ideal working fluid for vapour power cycles with regeneration and reheating. Gas turbine and steam turbine power plant with cogeneration.
CO702.3	To Understand the Properties and analysis of coal with combustion reaction and its equipments for burning coal. Layout of steam power plant and its various components.
CO702.4	To analyze the Components of hydroelectric power plant, its classification and its comparison with other power plant with hydrology containing rainfall, hydrograph.
CO702.5	To analyze the Components of nuclear reactor and its classification. Effect of nuclear waste on environment and its disposal.
CO702.6	To analyze the Components of gas turbine power plant and its classification. Different components of diesel power plant and its performance along with emerging technologies.

BE ME 703T COMPUTER AIDED DESIGN	
	The course will prepare student
CO703.1	To understand the Basic concept of CAD, Comparision between CAD and conventional design, generation of algorithms for basic geometric entities.
CO703.2	To learn the Introduction to windowing & clipping, 2D transportation, 3D transportation.
CO703.3	To analyze the Techniques for geometric modeling and assembly modeling.
CO703.4	To evaluate the Finite element analysis, one dimensional problem, Finite element modeling, Potential energy approach.
CO703.5	To understand Truss and Two dimensional FEM, Derivation of shape functions for CST element, Pre processing and Post processing.
CO703.6	To create Optimization in Design, objectives of optimum design, Johnson's method of optimum design, Optimum design with normal and redundant specifications of simple machine elements.
BEME704T and BEME704P ENERGY CONVERSION - II (Theory)	
	The course will prepare student
CO704.1	To understand the Construction, operation and analysis of Positive displacement type of air compressors.
CO704.2	To understand the Construction, operation and analysis of Blowers, Centrifugal and Axial flow compressor
CO704.3	To learn the Introduction, classification , working, Combustion and Fuel injection systems.
CO704.4	To evaluate Testing and Performance of I. C. Engines with measuring instruments.

CO704.5	To do Detail analysis of conventional single stage vapour compression refrigeration system and Introduction to Vapor absorption and air refrigeration system.
CO704.6	To study the Introduction and analyze simple Air conditioning system.
BE ME 705 T DESIGN OF MECHANICAL DRIVES	
	The course will prepare student
CO705.1	To understand and analyze the Design of Coupling, Design of Flywheel: Functions, design of flywheel. Design of Bearings:
CO705.2	To understand and analyze the Design of Flat belt drive, analysis of belt tension, condition for transmitting maximum power, Design of V belt drive: Design of Roller chain drive, Design of wire rope drive:
CO705.3	To understand and analyze the Design of Gears, Design of Spur Gear drive, Helical Gear drive. Design of Bevel Gear Drive
CO705.4	To understand and analyze the Design of Worm Gear Drive, Design of I. C. Engine components, Introduction to selection of material for I. C. engine components
BE ME 801T INDUSTRIAL MANAGEMENT	
	The course will prepare student
CO801.1	To understand the Various principles, concepts of management, Principles of Henry Fayol & its functions.
CO801.2	To know the Meaning, functions of personal management, worker's welfare.
CO801.3	To know the Meaning & concepts of marketing management, new product development.
CO801.4	To understand Financial management, sources of finance & various concepts related to budget.
CO801.5	To study the Meaning, principles & selection of plant location, plant layout, Industrial safety, types of production.
CO801.6	To study Recent trends in production & operation management, Reverse Engineering.

ELECTIVE-II BE ME 802 T (5) REFRIGERATION AND AIRCONDITIONING (Theory)	
	The course will prepare student
CO802(5).1	To study the Introduction to basics of various refrigeration cycles and its nomenclature.
CO802(5).2	To understand the Compound Vapour Compression Refrigeration system and multiple evaporator system.
CO802(5).3	To study and analyze Air cycle refrigeration & its application.
CO802(5).4	To understand the Basics and application of the Cryogenics.
CO802(5).5	To Study various Advanced Psychometric processes.
CO802(5).6	To Study the calculation of Heat Load and designing of air conditioner according to inputs.
ELECTIVE-III BE ME 803 T(1) ADVANCED MANUFACTURING TECHNIQUES (Theory)	
	The course will prepare student
CO802(1).1	To understand the Need, classification and historical development of nontraditional machining processes.
CO802(1).2	To Understand the Machining and process parameters of AJM process, Ultrasonic machining process, water jet machining process.
CO802(1).3	To study ECM, EDM, LBM and plasma arc machining process.
CO802(1).4	Details study of MIG and TIG, LASER beam welding and submerge arc welding etc.
CO802(1).5	To study solid phase welding such as ultrasonic welding, friction welding with recent developments.
CO802(1).6	Categorise the various advanced casting process based on energy sources and mechanism employed and to select the best suitable advanced casting processfor casting of unconventional materials employed in modern manufacturing industries
BE ME 803 T -ADVANCE INTERNAL COMBUSTION (IC) ENGINE	
	The course will prepare student

CO803.1	Study of engine classification, its components, different lubrication system and engine losses.
CO803.2	Study of conventional and alternative fuel of automobile with the fuel injection system.
CO803.3	Study of combustion stages, ignition system and modern techniques of charging the S.I. engine
CO803.4	Study of combustion stages, ignition system and modern techniques of charging the C.I. engine with auxiliary apparatus.
CO803.5	Study of air pollution cause due to I.C. engine with exhaust treatment system for controlling the pollution
CO803.6	Study of the testing of all important parameter of the engine, with its characteristics
BE ME 804 T - COMPUTER APPLICATIONS IN POWER SYSTEM	
	The course will prepare student
CO804.1	To evaluate bus Impedance & Admittance matrix by graphically, inspection and building algorithm.
CO804.2	To evaluate Load flow study of a power system by Newton- Raphson and Gauss- Seidal iterative method.
CO804.3	To understand Short circuit studies.
CO804.4	To evaluate Transient stability by using Eulers, Modified Eulers and RK-4th order differential method.
BE ME 805T ENERGY CONVERSION - III	
	The course will prepare student
CO805.1	To understand the Principles and working, and analysis of Gas Turbine.
CO805.2	To understand the Principles & working of turbojet, tuboprop, Ramjet & pulse jet and its analysis. Introduction and working of Nuclear Power Plant.
CO805.3	To study the principle and working of various solar energy equipments.
CO805.4	To study Energy Auditing.
CO805.5	Study of various Hydraulic systems.
CO805.6	Study of various Pneumatic Systems.
BE ME 805T2 COMPUTER INTEGRATED MANUFACTURING	
	The course will prepare student

CO805.1	Explain the Evolution , Concept ,scope and Components of CIM along with the Basic Concept of Concurrent Engineering.
CO805.2	Compare the NC, CNC & DNC machines Understand the Basic Components and classification of CNC machine tools.
CO805.3	Identify the functions of Group Technology, benefits of GT and issues in GT. Part families, classification and coding with Production flow analysis.
CO805.4	Explain the Flexible manufacturing systems,Level of Flexibility. Understand FMS components,Material handling & storage system, along with FMS Layout Configurations.
CO805.5	Elaborate the Manufacturing Planning,Computer aided process planning (CAPP), Retrieval & Generative CAPP systems and various Production Planning.
CO805.6	Discuss the Computerized statistical process control, Shop floor control, Shop floor data collection techniques, CAQC and Automated inspection devices.
BE ME 804T AUTOMATION IN PRODUCTION	
	The course will prepare student
CO804.1	To Design and Develop the Definition, types, reasons, strategies for automating, arguments for and against
CO804.2	To Design the automation along with partial automation and manual assembly lines.
CO804.3	To Design the Basic concepts, coordinate system and machine motion,Types of NC system ,part programming and tape formats, APT programming and Adaptive control.
CO804.4	To Design and Develop the Introduction, to robot anatomy, end effectors, sensors, robot programming and applications .
CO804.5	To Design the Automated Guided Vehicle Systems and their Types, AGVS. Vehicle guidance & routing, Traffic control & AS/RS.
CO804.6	To Develop the Automated inspections,Machine vision image acquisition & digitization, image processing.

DEPARTMENT OF FIRST YEAR ENGINEERING

FIRST SEMESTER

COURSE OUTCOMES

BESI-1T	**Applied Mathematics - 1**
CO101.1	Student learned the skill of finding nth derivative of standard functions and product functions. They can find series expansion of functions and apply the knowledge of derivation to find limiting values of indeterminate forms and curvature
CO101.2	Student achieve the skill of several partial differential of first and higher order for functions of several variables and they apply the skill for finding series expansion of functions of two variables, maxima and minima of function of two variables
CO101.3	Students can find inverse of matrix by adjoint and partitioning method they can apply this skill to solve system of linear equation. They can find rank of a matrix consistency of system of equations
CO101.4	Student know how to solve first order first degree and higher degree equations, linear reducible to linear and exact differential equations. They can apply this knowledge to solve engineering problems in simple electrical circuit.
CO101.5	Student gain the knowledge to solve higher order differential equations with constant coefficients, simultaneous differential equations, special type of equations and apply their knowledge to differential equations in various engineering problems such as oscillation of a spring, deflection of beam etc
CO101.6	Students learn Cartesian and polar forms of complex numbers, geometrical representation of fundamental operations on complex numbers, De Movieer theorem, roots of complex number hyperbolic functions and their inverse. Logarithm of complex numbers separation into real and imaginary parts

BESI-2T	Engineering Physics
CO102.1	Understand the basic concepts in quantum mechanics. Able to use the acquired knowledge for engineering applications. Analyze and solve the mathematical based numerical in Engineering Physics
CO102.2	Understand the basic concepts of Wave packet & Wave equation. Derive, Demonstrate, prove the expression for experimental based phenomenon in engineering physics
CO102.3	Acquire fundamental understanding of concepts and principles concern to crystal structure and able to apply them for their engineering applications. Develop ability to apply acquired knowledge to solve engineering problems
CO102.4	Develop ability to demonstrate theoretical fundamental concepts in Semiconductor Physics experimentally. Able to use the acquired knowledge to identify, draw, construct and design devices for engineering applications and solve engineering problems based on them.

Subject code: BESI-3T	Engineering Chemistry
CO103.1	Students will understand the basic significance of quality of water for drinking and industrial use.
CO103.2	Students will understand various corrosion phenomena and their practical application to control corrosion in various situations.
CO103.3	Students will gain basic knowledge about the traditional construction materials and the new trends applied in the engineering field
CO103.4	Students will understand the basic principles of Green Chemistry and its applications for protection of the environment and learn the working of batteries and their applications in various fields of Engineering

BESI-7 (P)	Communication Skill

CO107.1	Students learn the correct method for formal correspondence in writing letters, reports and resumes.
CO107.2	Students learn the correct method for formal correspondence in writing letters, reports and resumes.
CO107.3	To clear the concept of grammar usage and vocabulary.
CO107.4	To develop self confidence in oral communication and reading.
CO107.5	To overcome the barriers in the GDPI and develop analytical perspective through mock drills.

SECOND SEMESTER

BESII-1	**Applied Mathematics – II**
CO201.1	Students leraned to use Gamma and Beta functions for evaluating definite integrals in simplified way. Also they learned the technique of differentiation under integration sign to evaluate difficult definite integrals in engineering problems. They can find mean value , M.S.V. and R.M.S.V. of periodic funs
CO201.2	Students developed the skill to trace Cartesian , polar , parametric curves and can apply this knowledge to find area between two curves , surface area , volume of solid of revolution
CO201.3	Students can evaluate double and triple integrals and can apply this technique for finding area between two curves , volume , mass and C.G
CO201.4	Students can find triple , quadruple product of vectors and can solve vector equations. They can resolve components of vectors in different directions. They understand the concept of irrotational , solenoidal vectors , gradient and directional derivatives
CO201.5	Students developed the skill of evaluating line , surface and volume integrals. They evaluate multiple integrals using relation between single , double and triple integrals
CO201.6	Students can fit straight line , parabola and exponential curves to the given data using least square method. They can find lines of regression and correlation coefficient. Also Students know the techniques to find the missing terms in discrete data for unequal intervals and find analytical solution of difference equations which are very useful for various branches of engineering

BESII-2T	**Advance Physics**
CO202.1	Acquire fundamental understanding of concepts and principles concern to laser & Wave optics and their engineering applications. Develop ability to apply acquired knowledge to solve engineering

	problems.
CO202.2	Develop ability to demonstrate theoretical concept experimentally concern to Electron ballistics and to apply the acquired knowledge to solve engineering problems
CO202.3	Gain understanding of fundamental concepts and principles concern to Electron optics and their engineering applications.
CO202.4	Understand fundamental concepts and principles concern to Fibre optics & Nanoscience and apply them for their engineering applications. Develop systematic logical approach to apply acquired knowledge to solve engineering problems

BESII-3T	**Material Chemistry**
CO203.1	Students will learn the basic significance of non-Conventional energy sources and Bio-Fuels and their applications.
CO203.2	Students will learn the use of liquid fuels in different types of engines and the basic concepts of combustion process to achieve minimization of environmental pollution.
CO203.3	Students will develop the ability to select the lubricants for various purposes
CO203.4	Students will gain knowledge of the properties and applications of contemporary polymers and composites along with the newer nano-materials in various engineering fields

BESII-8T	**Ethical Science**
CO208.1	To understand the civic and law structure of society.

CO208.2	Applying psychology principal on human working conditions and have humanistic approach.
CO208.3	To understand the ethical concept of society in which on lives and be acquainted with the working environment and organization.
CO208.4	To gain knowledge of the Country's Constitution and political structure of society
CO208.5	To understand the ethical concept of society in which on lives and be acquainted with the working environment and organization.

Course Objective of all Subject

MBA: Semester –I

Course / Course Code: Principles of Management / (MBCI - 1)

The students will be able to..

CO-1: Understand the basic concept of Management and areas covered under the field of Management

CO-2: Enumerate the basics of planning and controlling as basic Management tool

CO-3: Describe the basics of directing, staffing and organization as basic Management tools

CO-4: Understand and gain an in-depth insight about the various zones of International Management adopted by various countries

Course / Course Code: Managerial Economics / (MBCI - 2)

The students will be able to..

CO-1: Discuss the basic concepts of demand, supply and equilibrium and their determinants, analyzing the effect of these factors on market dynamics

CO-2: Describe the understanding and estimating production function, Understanding cost function and the difference between short-run and long-run cost function, establish the linkage between production function and cost function

CO-3: Compare and contrast four basic market types

CO-4: Define the concept of national income and its components

Course / Course Code: Accounting for Managers (MBCI - 3)

The students will be able to..

CO-1: Recognize practical and theoretical knowledge of financial accounting

CO-2: Identify and analyze complex financial accounting problems

CO-3: Evaluate and analyze various options with the help of capital budgeting techniques

CO-4: Describe the issues of working capital, cash management, Receivable Management and Inventory Management

Course / Course Code: Business Legislation (MBCI - 4)

The students will be able to..

CO-1: Appreciate the relevance of business law to individuals and business and identify the fundamental legal principles behind contractual agreements

CO-2: Explain the rights of the consumers and the ways to resolve disputes

CO-3: Interpret the legal and fiscal structure of different forms of business organizations and their responsibilities as an employer

CO-4: Acquire problem solving techniques and to be able to present coherent, concise legal argument

Course / Course Code: Business Communication and Information System / (MBCI - 5)

The students will be able to..

CO-1: Demonstrate a good understanding of effective business writing and business communication

CO-2: Identify interpersonal communications

CO-3: Describe the role of information technology and information systems in business

CO-4: Explain how to use information technology to solve business problems

Course / Course Code: Research Methodology & Quantitative Techniques / (MBCI - 6)

The students will be able to..

CO-1: Interpret the meaning and applications of statistics and Quantitative techniques in business

CO-2: Perform the correlations and regression methods and know the decision making by various forecasting methods

CO-3: Understand the basic concept and process of research

CO-4: Identify the various methods of data collection and testing of hypothesis in research

MBA Semester: II (EVEN)

Course / Course Code: MBCII - 1 – Human Resource Management & Organizational Behavior

The students will be able to..

CO-1: Apply the key terms, theories/concepts and practices within the field of HRM & OB

CO-2: Demonstrate the skills required for recruitment, selection, employee training and performance appraisal

CO-3: Analyze various motivational theories for better understanding and Create and apply new ideas, methods and ways of thinking

CO-4: Associate with the systematic/structured approach to solve organizational problems

Course / Course Code: : MBCII - 2 – Financial Management

The students will be able to..

CO-1: Obtain a detailed knowledge about the various sources of finance

CO-2: Identify, analyze and calculate various problems using various tools and techniques available under the umbrella of financial management with respect to capital structure

CO-3: Apply various techniques of capital budgeting and develop a deep insight of the decision making process

CO-4: Correlate the class room teachings with the factual evaluation of working capital management

Course / Course Code: MBCII - 3 – Marketing Management

The students will be able to..

CO-1: Understand the marketing concept

CO-2: Apply product development and the strategies used in various stages of product life cycle

CO-3: Classify the distribution channels and promotion decisions

CO-4: Analyze the marketing research process and new trends in marketing

Course / Course Code: MBCII - 4 – Operations Management

The students will be able to..

CO-1: Demonstrate the knowledge of operations management and its applications in various functional areas

CO-2: Associate the planning, controlling and process of goods and services so to maximize the profit of an organization

CO-3: Analyze the inventory management to develop a managerial perspective to influence them for competitive advantage

CO-4: Inculcate and apply the various quality tools to improve productivity technique in manufacturing unit

Course / Course Code: MBCII - 5 – Cost Accounting

The students will be able to..

CO-1: Comprehend how cost accounting is used for decision making and performance evaluation and explain the basic concept of cost and how costs are presented in financial statements

CO-2: Determine how materials, labor and overhead are added to product at each stage of the cost sheet statement

CO-3: Interpret variable cost variance and find out variances and Ascertain cost per unit of service costing/operating costing

CO-4: Demonstrate the features of contract costing and compute cost and profit of contracts

Course / Course Code: MBCII - 6 – Economic Environment of Business

The students will be able to..

CO-1: Explain the meaning and features of business environment

CO-2: Analyze the importance and types of business environment

CO-3: Enumerate the recent developments in Indian Economy that have greatly influenced the working of business units in India

CO-4: Analyze the debt position of Indian economy through Balance of Payment concept.

MBA: Semester - III

Elective / Specialization: Compulsory Paper

Course / Course Code: MBCIII - 1: Strategic Management

The students will be able to..

CO-1: Design the business goals, objectives and plan for strategic decision making

CO-2: Analyze industry including various models and matrix

CO-3: Categorize the corporate, business and functional level strategy

CO-4: Evaluate the international portfolio strategies and move towards the steps of innovative thinking

Elective / Specialization: Foundation Course

Course / Course Code: Environment Management / MBFIII - 1

The students will be able to..

CO-1: Gain skills and improved understanding of how to work with sustainability issues such as environmental and natural resource management

CO-2: Illustrate the concept of ecosystem and productive use of biodiversity

CO-3: Find the measures and control of various types of environmental pollution such as Air, Soil, Water, Noise, thermal & Nuclear Pollution

CO-4: Analyze and provide solutions to various social issues in environment

Elective / Specialization: CORE GROUP: FINANCIAL MANAGEMENT

Course / Course Code: MBEIII-11 –Corporate Financial Management

The students will be able to..

CO-1: Determine the importance of risk within the context of financial decision making

CO-2: Comprehend the theoretical, practical and ethical perspective of project financing, leasing and hire purchase

CO-3: Assess the valuation of business plans and dividend payout options

CO-4: Analyze and evaluate the corporate restructuring models of mergers and acquisitions taking place in the corporate world and understand contemporary issues of financial management

Elective / Specialization: CORE GROUP: FINANCIAL MANAGEMENT

Course / Course Code: MBEIII - 12 - Security, Portfolio and Risk Management

The students will be able to..

CO-1: Analyze various investment options available with the calculation of risk and return associated with the investment

CO-2: Interpret the various investment options through fundamental and technical analyses

CO-3: Evaluate the bond and shares through various methods

CO-4: Determine the pay off position through the valuation methods

Elective / Specialization: CORE GROUP – C – HUMAN RESOURCE MANAGEMENT

Course / Course Code: Paper 1 Training & Development Practices- MBEIII - 11

The students will be able to..

CO-1: Associate the objectives and benefits of training and training need analysis to locate the gap between organization and industry

CO-2: Apply the training process and the various methods used for training purpose

CO-3: Comprehend the evaluation techniques used for training in the industry and upgrade with the new methods and trends coming up

CO-4: Relate to the concept of management development and the types of management development training available and implemented in the industries.

Elective / Specialization: CORE GROUP – C – HUMAN RESOURCE MANAGEMENT

Course / Course Code: Paper 2 –Performance and Compensation Management- MBEIII - 12

The students will be able to..

CO-1: Evaluate the key aspects of performance management and performance appraisal

CO-2: Associate to the theoretical and ethical perspective of aspects of performance appraisal methods and techniques

CO-3: Use of the concepts of compensation planning and its components

CO-4: Analyze the field of career management and issues related to it

Elective / Specialization: Core Group – A – Marketing Management (Paper-1)

Course / Course Code: MBEIII - 11: Sales and Distribution Management

The students will be able to..

CO-1: Utilize the Sales Management skills to manage sales force

CO-2: Evaluate the various consumer buying behavior models and formulate strategies of sales management

CO-3: Apply various techniques to motivate the Sales team and understand the concept of supply chain management, transportation and distribution channel

CO-4: Analyze the supply chain management process and e-enabled logistics management system

Elective / Specialization: Core Group-A: Marketing Management: Paper-2

Course / Course Code: Integrated Marketing Communication & Brand Management MBEIV - 12

The students will be able to..

CO-1: Correlate the functional areas of marketing communication and integrated marketing communication.

CO-2: Associate the knowledge of media available for IMC and various promotional tools

CO-3: Comprehend the concept of brand and analyze the branding opportunities and brand equity

CO-4: Apply the concept of brand and define a brand name & mantras for designing and implementing branding strategies

MBA: Semester: IV (EVEN)

Elective / Specialization: Compulsory Paper

Course / Course Code: MBCIV - 1 –Business Ethics and Corporate Governance

The students will be able to..

CO-1: Design the ethical theories and frameworks to analyze ethical dilemmas in business and resolve practical problems.

CO-2: Evaluate the Indian Business scenario, organizational ethics & CSR and can be implemented in real life situations.

CO-3: Derive the accountability hierarchy from corporate governance perspective.

CO-4: Develop the role of HRM in creating an ethical organization.

Elective / Specialization: Compulsory Paper

Course / Course Code: : MBCIV - 2 – Entrepreneurship Development

The students will be able to..

CO-1: Identify an attractive business opportunity and common pitfalls during the entrepreneurial process

CO-2: Evaluate various methods that can be used to minimize uncertainties at different stages of the entrepreneurial process

CO-3: Analyze the commercial viability of new technologies, business opportunities and existing companies

CO-4: Plan, organize, and execute a project or new venture with the goal of bringing new products and service to the market

Elective / Specialization: Foundation Course

Course / Course Code: MBFIV - 2 – International Business Management

The students will be able to..

CO-1: Analyze the issues involved in entering foreign markets, global production and outsourcing as well as logistics and supply chain issues

CO-2: Justify the theoretical, practical and ethical perspective on many aspects of foreign trade

CO-3: Evaluate the issues of exchange rate management

CO-4: Assess the various factors and issues affecting the business environment at international level and also foresee different market dynamics and strategies used in international market on a competitive basis

Elective / Specialization: Core Group-A: Marketing Management: Paper-3

Course / Course Code: MBEIV - 13 – Consumer Buying Behavior

The students will be able to..

CO-1: Develop the consumer behavior models which can be functional in marketing

CO-2: Identify the factors which influence consumer behavior to develop, evaluate, and implement effective marketing strategies and display critical thinking and problem solving skills in marketing

CO-3: Evaluate and create the information about the consumer in segmented market based on existing knowledge, sources and experiences

CO-4: Design the work environment effectively to prepare a professional, logical and sound report on consumer behavior issues within a specific context and develop an effective CBB model

Elective / Specialization: CORE GROUP – B – FINANCIAL MANAGEMENT

Course / Course Code: Investment Environment and Wealth Management / MBEIV 13

The students will be able to..

CO-1: Evaluate the theoretical aspects of wealth management

CO-2: Generate the short term and long term investment options

CO-3: Support the concept and importance of insurance

CO-4: Evaluate the various mutual funds and analyze the calculation of net asset value

Elective / Specialization: CORE GROUP – C – HUMAN RESOURCE MANAGEMENT

Course / Course Code: MBIV-13-Industrial Relations & Labor Laws

The students will be able to..

CO-1: Identify the key participants in any industrial relations system – workers, employers, trade unions, employer organizations

CO-2: Correlate theoretical, practical and ethical perspective on many aspects of industrial conflicts

CO-3: Demonstrate the factual situations of wage legislations available in the industry

CO-4: Compare various acts available with respect to social security