PROGRAM OUTCOMES

FOR B.TECH COURSES

Engineering Graduates will be able to:

1. Apply the knowledge of mathematics, science and engineering fundamentals to the solution of nature of the complex engineering problems.
2. Identify, formulate, review and analyze complex engineering problems and its solutions using principles of mathematics, natural sciences, and engineering sciences.
3. Design appropriate solutions for complex engineering problems and design system components or developing the processes that meet the specified requirements with appropriate consideration for the public health / safety
4. Use research-based knowledge and research methods including design of experimental models, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. 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.
6. 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.
7. Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of and need for sustainable development.
8. Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary settings.
10. 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.
11. 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.
12. 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

FOR M.TECH, MBA & MCA COURSES

The students of Post Graduate Programme will be able to

1. An ability to independently carry out research /investigation and development work to solve practical problems
2. An ability to write and present a substantial technical report/document
3. Students should be able to demonstrate a degree of mastery over the area as per the specialization of the program. The mastery should be at a level higher than the requirements in the appropriate bachelor program
4. An ability to apply engineering to manage projects in engineering and multidisciplinary environments efficiently.
5. An ability to design and conduct experiments, as well as to analyze and interpret data.
6. An ability to design and construct a computer hardware and software system, component, or process to meet desired needs within realistic constraints.
7. An ability to function on multi-disciplinary teams.
8. An ability to identify, formulates, and solves computer engineering problems.
9. An understanding of professional, social and ethical responsibility.
10. An ability to communicate effectively.
11. The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.
12. An ability to use the IT techniques, skills, and modern engineering tools necessary for engineering practice.
13. An ability to logically analyze a problem and model it as a computing system.
14. 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

PROGRAM SPECIFIC OUTCOMES

1. B. TECH IN CIVIL ENGINEERING

On completion of the B.TECH (Civil Engineering) degree the graduates will be able to

- Plan, analyze, design, prepare cost estimates and execute all kinds of Civil Engineering Projects.
- Apply modern construction techniques, equipment and management tools so as to complete the project within specified time and funds.

2. B. TECH IN COMPUTER SCIENCE AND ENGINEERING

On completion of the B.TECH (Computer Science & Engineering) degree the graduates will be able to

- Apply standard Software Engineering practices and strategies in real-time software project development using open-source programming environment or commercial environment to deliver quality product for the organization success
- Design and develop computer programs/computer-based systems in the areas related to algorithms, networking, web design, cloud computing, IoT and data analytics of varying complexity
- Acquaint with the contemporary trends in industrial/research settings and thereby innovate novel solutions to existing problems

3. B. TECH IN ELECTRICAL AND ELECTRONICS ENGINEERING

On completion of the B.TECH (Electrical and Electronics engineering) degree the graduates will be able to

- Develop technical knowledge, skill and competence in circuit design, control engineering, electrical machines and power system and power electronics.
- Adapt to technological changes, communicate clearly and efficiently, work collaboratively in a team as well as lead the team and practice responsibly in a global environment.

4. B. TECH IN ELECTRICAL ENGINEERING

On completion of the B.TECH (Electrical engineering) degree the graduates will be able to

- Apply the fundamentals of mathematics, science and engineering knowledge to identify formulate, design and investigate complex engineering problems of electric circuits, analog and digital electronics circuits, control systems, electrical machines and Power system.
- Apply the appropriate techniques and modern engineering hardware and software tools in electrical engineering to engage in life-long learning and to successfully adapt in multi-disciplinary environments.
- Aware of the impact of professional engineering solutions in societal, environmental context, professional ethics and be able to communicate effectively.

5. B. TECH IN ELECTRONICS AND COMMUNICATION ENGINEERING

On completion of the B.TECH (Electronics and Communication engineering) degree the graduates will be able to

- Apprehend and analyze specific engineering problems of communication, networking, electrical & electronics circuits, signal processing, computer programming, embedded systems, VLSI design and semiconductor technology by applying the knowledge of basic sciences, engineering mathematics and engineering fundamentals.
- Ability to design and implement the acquired technical knowledge with proficiency in logical programming for applications in electronics & communication engineering.
- Ability to communicate effectively with excellent interpersonal skills and demonstrate the practice of professional ethics for societal benefit.

6. B. TECH IN MECHANICAL ENGINEERING

On completion of the B.TECH (Mechanical engineering) degree the graduates will be able to

- Graduates of the program will achieve excellence in product design, thermal engineering and manufacturing system by acquiring knowledge in mathematics, science and designing principles.
- Graduate will be able to analyze, interpret and provide solutions to the real life mechanical engineering problems.
- Graduate will develop an approach to solve multidisciplinary problems of manufacturing and allied industries.
- Graduates will learn managerial skills to work effectively in a team and in a society by following ethical and environmental practices.

7. **MASTER IN BUSINESS ADMINISTRATION**

On completion of the Master in Business Administration degree the graduates will be able to

- Be business leaders and managers with leadership and problem-solving skills for global business.
- Drive entrepreneurship initiatives either on their own or within other organizations where they are employed.
- Have innovation skills and drive the businesses through multifaceted skills.
- Provide advancement of conceptual and practical knowledge in the field of business management to contribute to nation building while upholding ethical practices.

8. **MASTER IN COMPUTER APPLICATION**

On completion of the Master in Computer Application degree the graduates will be able to

- To provide opportunities for acquiring in-depth knowledge of fundamental concepts and programming skills for holistic development.
- Identify, formulate and solve complex computing problems reaching substantiated conclusions.
- To apply current tools, technologies and research to create systems for solving industry oriented problems.
- To develop the abilities to face the changing trends and career opportunities in computer application.
- To embed strong human values and professional ethics for becoming social responsibilities.

9. **M.TECH IN COMMUNICATION SYSTEM**

On completion of the M.Tech in Communication System degree the graduates will be able to

- Acquire in-depth knowledge of communication systems and engineering, including wider and global perspective.
- Able to discriminate, evaluate, analyze and synthesize existing and new knowledge, and integration of the same for enhancement of knowledge.
- Able to attain successful professional career by applying their Engineering skills in Wireless and Mobile Communication Systems to the challenges in industry, academia or in the pursuit of other fields.

- Able to engage in life-long learning, adapt to evolving technology, work in multidisciplinary research to design innovative products and provide solutions and become entrepreneurs.

10. **M.TECH IN COMPUTER SCIENCE ENGINEERING**

On completion of the M.Tech in Computer Science Engineering degree the graduates will be able to

- Able to clearly understand the concepts and applications in the field of Computer Science & Engineering, Software Development, Networking.
- Able to associate the learning from the courses related to Databases, Operating Systems, Data Structures, and Programming Languages to arrive at solutions to real world problems.
- To comprehend the technological advancements in the usage of modern tools to analyze and design subsystems/processes for a variety of applications.
- skills to communicate in both oral and written forms, the work already done and the future plans with necessary road maps, demonstrating the practice of professional ethics and the concerns for societal and environmental wellbeing

11. **M.TECH IN POWER SYSTEM ENGINEERING**

On completion of the M.Tech in Power System Engineering degree the graduates will be able to

- Develop technical knowledge, skill and competence in circuit design, control engineering, electrical machines, and power system and power electronics.
- Adapt to technological changes, communicate clearly and efficiently, work collaboratively in a team as well as lead the team and practice responsibly in a global environment.
- To comprehend the technological advancements in the usage of modern tools to analyze and design subsystems/processes for a variety of applications.
- skills to communicate in both oral and written forms, the work already done and the future plans with necessary road maps, demonstrating the practice of professional ethics and the concerns for societal and environmental wellbeing.

12. **M.TECH IN PRODUCTION ENGINEERING**

On completion of the M.Tech in Production Engineering degree the graduates will be able to

- Automate a mechanical system or a process to meet desired needs within realistic constraints such as health, safety and manufacturability.
- Use research based knowledge and research methods including design of experiments, analysis and interpretation of data and IT tools
- Apply knowledge and skill of various approaches in manufacturing technology and automation, for solving complex engineering problems.
- Apply creativity in designing manufacturing systems, components and processes.

13. **M.TECH IN STRUCTURAL ENGINEERING**

On completion of the M.Tech in Structural Engineering degree the graduates will be able to

- Proficient in planning, analysis, design and execution of diverse projects with due consideration to issues concerning society and environment.
- Adopt new innovative technology by continuously updating their knowledge through lifelong learning.
- Analyze socio-industrial problems and present feasible solutions through critical thinking and research.
- Continue professional development in this field or in related inter disciplinary fields with a background in structural engineering.

COURSE OUTCOMES OF B.TECH

B.TECH (CIVIL ENGINEERING)

MECHANICS OF SOLID

At the end of the course, the students will be able to:

1. Determine different stress & strain in materials under various loading conditions
2. Ddetermine critical load of compression members for different support conditions
3. Determine different stress & strain in cylinders & shells
4. Select appropriate method to locate failure planes in materials for different loading conditions.

FLUID MECHANICS & HYDRAULICS MACHINES

At the end of the course, the students will be able to:

1. Student are able to understand the fluid characteristics and their application in different material manufacturing industry
2. Student are able to measure the pressures at various conditions with different types of pressure measuring devices
3. Students are able to calculate the discharges of fluid
4. Student are able to calculate the force acting on submerged bodies

SURVEY

At the end of the course, the students will be able to:

1. Apply the basic principles of surveying and can carry out the survey in the field for various purposes using chain, compass, plane table and theodolite.
2. Perform levelling and contouring of given ground

TRANSPORTATION ENGINEERING

At the end of the course, the students will be able to:

1. Basic concept about Highway Engineering
2. To understand the principles of Highway geometrics design as per IRC standards
3. Perform geometric design for the Highway& Basic concept of Pavement design
4. To understand Types of pavements & Materials required for highway construction.
5. To understand Construction procedure for different type of pavements.

STRUCTURAL ANALYSIS-I

At the end of the course, the students will be able to:

1. Determine various internal forces in beams and frame from bending moment and shear force diagram
2. Select appropriate method to determine slope and deflection of determinate beams and frames
3. Determine internal forces in the members of plane & space truss, three hinged arch and cables
4. Determine absolute maximum internal forces due to rolling or moving loads from Influenced line diagrams.

CONSTRUCTION TECHNOLOGY

At the end of the course, the students will be able to:

1. Explain concreting in different environment and design the formwork.
2. Explain Fabrication and erection of structures by special construction methodology.
3. Explain construction of special structures.

CONCRETE TECHNOLOGY

At the end of the course, the students will be able to:

1. Identify different types of concrete and its properties.
2. Determine strength and durability of concrete.
3. Design concrete mixes for the given conditions.
4. Select types of admixture and special concrete for given condition.

STRUCTURAL ANALYSIS-II

At the end of the course, the students will be able to:

1. Determine the degree of static and kinematic indeterminacy of various types of structures and selection of method of analysis
2. Determine the internal force components using Slope deflection method, Moment distribution method, Kani's method, Strain energy method, Consistent deformation method and theorem of three moments.
3. Determine the internal force components using suitable method in two hinged arches and two hinged suspension cable bridges.

DESIGN OF STEEL STRUCTURE

At the end of the course, the students will able to;

1. Understand different rolled steel structural members and their connections
2. Design different types of connections (bolted & welded) as per Limit state design
3. Design different types of rolled steel structural members for axial and bending load as per Limit state design

4. Design plate girders as per Limit state design.
5. Design beam-column and appropriate column bases for steel columns as per Limit state design.

WATER SUPPLY AND SANITARY ENGINEERING

At the end of the course, the students will be able to:

1. Select appropriate treatment to raw water useful for domestic as well as construction purpose.
2. Maintain the pipe-network for water supply and Sewage disposal effectively.
3. Calculate and Estimate the impurities present in water used for domestic as well as construction works.
4. Prepare lay out plan and maintain water distribution and sewer-networks.
5. Test raw water as per the standard practices vi. Plan and implement house plumbing work effectively.

WATER RESOURCE ENGINEERING

At the end of the course, the students will be able to:

1. Check the consistency of rainfall data and calculate the probability of rainfall over a given return period.
2. Determine the evaporation, evapo-transpiration and rate of infiltration.
3. Apply the concept of various stream flow measurement methods and derive unit hydrograph, synthetic and instantaneous unit hydrograph.
4. Describe irrigation types and methods and determine water requirement of crops.
5. Classify the canals, design irrigation channels and apply the concept of Kennedy and Lacey theory, design Canal Fall & Cross Drainage Work.

FOUNDATION ENGINEERING

At the end of the course, the students will be able to:

1. Determine the vertical stress distribution on horizontal and vertical plane below the ground surface due to various shapes of footings.
2. Evaluate the bearing capacity of shallow foundations founded in soil.
3. Select type of pile foundations based on the soil type and its geotechnical design.
4. Identify type of earth pressures behind retaining structures.
5. Identify failure mechanisms of cuttings and embankment using slope stability analysis.

IRRIGATION ENGINEERING

At the end of the course, the students will be able to:

1. Understand and identify different types & methods of irrigation
2. Ddesign different surface & sub-surface irrigation methods
3. Use different types of flow measurement instruments
4. Design drainage system.

PAVEMENT DESIGN

At the end of the course, the students will be able to:

1. Analyze & identify the engineering characteristics of pavement materials & to adapt ideal material that will fit engineering requirements of road works
2. Explain the principles & factors affecting pavement design
3. Design of flexible and rigid pavements using IRC, AASHTO and other important methods of design
4. Optimally design pavement formation width components like carriageway, shoulder,

drainage etc. and inspect performance of composite theoretically.

PRESTRESSED CONCRETE

At the end of the course, the students will be able to:

1. Determine the prestressing force required in beam for a prestressing systems
2. Compute losses and deflections of prestressed concrete members
3. Compute Flexural Strength &Torsional Resistance of Prestressed Concrete Members
4. Design End Blocks of a post tensioned prestressed concrete member
5. Design continuous prestressed concrete beams
6. Design prestressed concrete pipes, mast and railway sleepers.

GROUND IMPROVEMENT TECHNIQUES

At the end of the course, the students will be able to:

1. Apply the ground improvement technique using admixtures and advanced technique using grouting
2. Identify the relevance of reinforcing elements to resist the lateral earth pressures
3. Apply suitable techniques for the deep compaction of granular soils and improvement of cohesive soils
4. Uutilize ground anchors and soil nails for design of soil retained structures
5. Identify methods to accelerate the consolidation settlement of cohesive soil using preloading methods and vertical drains.

B.TECH (COMPUTER SCIENCE ENGINEERING)

ARTIFICIAL INTELLIGENCE

At the end of the course, the students will be able to:

1. Demonstration of building blocks of AI in terms of intelligent agent.
2. Apply concept of natural language processing for problem solving and development of intelligent algorithm for intelligent system

SOFTWARE ENGINEERING

At the end of the course, the students will be able to:

1. Cite the knowledge of students to document a software system.
2. Descried the functional and non functional requirements.
3. Categorize different components used in the software system.
4. Improve quality of software by selecting proper architecture.

OBJECT ORIENTED PROGRAMMING WITH JAVA

At the end of the course, the students will be able to:

1. Understand the difference between object oriented programming and procedural oriented language and data types in java.
2. Program using java features such as composition of objects, Operator overloading, inheritance, Polymorphism etc.
3. Simulate the problem in the subjects like Operating system, Computer networks and real world problems.

SYSTEM PROGRAMMING

At the end of the course, the students will be able to:

1. Master in the usage of makefiles, linking, object files, loading, symbol resolution, shared and static libraries, debugging, and execution of system programs.
2. Be familiar with basic UNIX OS concepts such as: process, program, process groups, signals, running programs, process control, address space, user and kernel modes, system calls, and context switching.
3. Master in file I/O (i.e. open, close, read, write, seek)

DATA ANALYTICS

At the end of the course, the students will be able to:

1. Apply computing theory, languages and algorithms, as well as mathematical and statistical models, and the principles of optimization to appropriately formulate and use data analyses.

DATABASE SYSTEMS

At the end of the course, the students will be able to:

1. Define database system concepts and apply normalization to the database.
2. Explain the basic processing and optimization, different transaction processing concepts.
3. Use different concurrency control techniques, different types of database failures and techniques to recover from such failures.

COMPUTER ORGANIZATIONS AND ARCHITECTURE

At the end of the course, the students will be able to:

1. Basic organization of computer and the architecture of 8086 microprocessor.
2. Implement assembly language program for given task for 8086 microprocessor.
3. Identify and compare different methods for computer I/O mechanisms.

DESIGNS AND ANALYSIS OF ALGORITHMS

At the end of the course, the students will be able to:

1. Define the basic concepts of algorithms.
2. Analyze the performance of algorithms, various algorithm design techniques for developing algorithms, various searching, sorting and graph traversal algorithms.

FORMAL LANGUAGES AND AUTOMATA THEORY

At the end of the course, the students will be able to:

1. Understand the basic concepts of formal languages, automata and grammar types.
2. Use of formal languages and reduction in normal forms, relation between regular expressions, automata, languages and grammar with formal mathematical methods.
3. Design push down automata, cellular automata and turing machines

SKILL PROJECTS AND HANDS ON

At the end of the course, the students will be able to:

1. Work on multidisciplinary Problems. Students should be able to
2. work as professionals from data management, network configuration, designing hardware, database and software design to management and administration of entire systems.

REAL-TIME SYSTEMS

At the end of the course, the students will be able to:

1. Students can able to develop real-time algorithm for task scheduling,.
2. Understand the working of real-time operating systems and real-time database.

OPERATING SYSTEM

At the end of the course, the students will be able to:

1. Understand the basics of operating systems like kernel, shell, types and views of operating systems.
2. Describe the various CPU scheduling algorithms and remove deadlocks.
3. Explain various memory management techniques, Use disk management and disk scheduling algorithms for better utilization of external memory.
4. Explain the various features of distributed OS like Unix, Linux, windows etc.

CLOUD COMPUTING

At the end of the course, the students will be able to:

1. Define different Cloud service and deployment models.
2. Describe importance of virtualization along with their technologies.
3. Describe the key components of Amazon web Service.

DATA MINING AND DATA WAREHOUSING

At the end of the course, the students will be able to:

1. Learn to organize and prepare the data needed for data mining using pre preprocessing techniques.
2. Understand data mining principles and techniques.
3. Describing and demonstrating basic data mining algorithms, methods, and tools.

INFORMATION RETRIEVAL

At the end of the course, the students will be able to:

1. Identify Data Base Management systems and data ware houses.
2. Use knowledge of data structures and indexing methods in information retrieval Systems,
3. Choose clustering and searching techniques for different data base systems.

ADVANCED COMPUTER ARCHITECTURE

At the end of the course, the students will be able to:

1. Design basic and intermediate RISC pipelines, including the instruction set, data paths, and ways of dealing with pipeline hazards.
2. State and compare properties of shared memory and distributed multiprocessor systems and cache coherency protocols.
3. Understand memory hierarchy design, memory access time formula, performance improvement techniques, and trade-offs.

COMPUTER GRAPHICS

At the end of the course, the students will be able to:

1. Understand the basics of computer graphics, different graphics systems and applications of computer graphics,
2. Understand various algorithms for scan conversion and filling of basic objects and their comparative analysis,
3. Understand extract scene with different clipping methods and its transformation to graphics display device.

ADVANCED JAVA PROGRAMMING

At the end of the course, the students will be able to:

1. Learn to use Graphics, Animations and Multithreading for designing Simulation and Game based applications.
2. Design and develop GUI applications using Abstract Windowing Toolkit (AWT), Swing and Event Handling.
3. Design and develop Web applications.

INTERNET OF THINGS

At the end of the course, the students will be able to:

1. Apply the concepts of IOT.
2. Identify the different technology of IOT on different applications

SOFTWARE TESTING

At the end of the course, the students will be able to:

1. Investigate the reason for bugs and analyze the principles in software testing to prevent and remove bugs.
2. Implement various test processes for quality improvement.

PARALLEL ALGORITHMS

At the end of the course, the students will be able to:

1. Familiar with the wide applicability of graph theory and tree algorithms as an abstraction for the analysis of many practical problems, efficient parallel algorithms related to many areas of computer science.

EMBEDDED SYSTEMS

At the end of the course, the students will be able to:

1. The embedded system concepts and architecture of embedded systems, the architecture of 8051 microcontroller.
2. Write embedded program for 8051 microcontroller.

COMPUTER NETWORK AND DATA COMMUNICATION

At the end of the course, the students will be able to:

1. Describe the functions of each layer in OSI and TCP/IP model.
2. Classify the routing protocols and analyze how to assign the IP addresses for the given network.
3. Define various examples of wireless communication system, standards related to 2G and 3G wireless networks.

COMPILER DESIGN

At the end of the course, the students will be able to:

1. Program language structures, translation, loading, execution, and storage allocation;
2. Compilation of simple expressions and statements;
3. Know organization of compiler including compile-time and run-time symbol tables, lexical scan, syntax scan, object code generation, error diagnostics, object code optimization techniques, and overall design;
4. Use of compiler writing languages and bootstrapping.

NEURAL LANGUAGE PROCESSING

At the end of the course, the students will be able to:

1. To understand the approaches to syntax and semantics in Natural Language Processing, the various types of language processors,
2. To understand the basic parsing strategies for context-free grammars, the data structures and algorithms for parsing, explain

3. apply the fundamental algorithms and techniques in the area of Natural Language Processing

WIRELESS SENSOR NETWORK

At the end of the course, the students will be able to:

1. Explain the basic concepts of wireless network and wireless generations,
2. Demonstrate the different wireless technologies such as CDMA, GSM, GPRS etc

INTERNET & WEB TECHNOLOGY

At the end of the course, the students will be able to:

1. The internet and related internet concepts that are vital in understanding web development.
2. Demonstrate the important HTML tags for designing static pages and separate design from content using Cascading Style sheet.
3. Utilize the concepts of JavaScript and Java

PATTERN RECOGNITION

At the end of the course, the students will be able to:

1. Analyze classification problems probabilistically and estimate classifier performance,
2. Understand and analyze methods for automatic training of classification systems

MACHINE LEARNING

At the end of the course, the students will be able to:

1. The student will be able evaluate and compare the performance or, other qualities, of algorithms for typical learning problems,
2. Design a supervised or unsupervised learning system.

ADVANCED OPERATING SYSTEM

At the end of the course, the students will be able to:

1. Describe the important computer system resources and the role of operating system in their management policies and algorithms.
2. Understand the process management policies and scheduling of processes by CPU

SOFT COMPUTING

At the end of the course, the students will be able to:

1. Understand basics of fuzzy system, genetic algorithms & their relations.
2. Apply genetic algorithms & artificial neural network as computation tools to solve a variety of problems in various areas of interest ranging from optimization problems to text analytics.

CRYPTOGRAPHY & NETWORK SECURITY

At the end of the course, the students will be able to:

1. The overview about information security, which includes an overview of

public and secret key cryptosystems.

2. Comprehend and apply authentication services and mechanisms

MOBILE COMPUTING

At the end of the course, the students will be able to:

1. Apply the fundamental design paradigms and technologies to mobile computing applications.
2. Develop consumer and enterprise mobile applications using representative mobile devices and platforms using modern development methodologies.

SOFTWARE PROJECT MANAGEMENT

At the end of the course, the students will be able to:

1. Carry out an evaluation and selection of projects against strategic, technical and economic criteria and use a variety of cost benefit evaluation techniques for choosing among competing project proposals.
2. Identify project risks, monitor and track project deadlines and produce a work plan and resource schedule.

B.TECH (ELECTRONICS & COMMUNICATION ENGINEERING)

SATELLITE COMMUNICATION

Students will be able to

1. Understand the communication satellite design.
2. Understand how analog and digital technologies are used for satellite communication networks.
3. Learn the design of satellite links

OPTICAL COMMUNICATION NETWORK

Students will be able to

1. Recognize and classify the structures of Optical fiber and types.
2. Classify the Optical sources and detectors and to discuss their principle.
3. Analyze various coupling losses.

DIGITAL IMAGE PROCESSING

Students will be able to

1. Analyze images in the frequency domain using various transforms.
2. Evaluate the techniques for image enhancement and image restoration

MOBILE COMPUTING

Students will be able to

1. Describe infrastructures and technologies of mobile computing technologies.
2. Explain the principles and theories of mobile computing technologies.

3. Ddescribe the possible future of mobile computing technologies and applications.

ANALOG COMMUNICATION

Students will be able to

1. Develop an understanding and performance of Analog modulation and demodulation techniques.
2. Apply Fourier Transform in the analysis of digital communication system.
3. Understand Signal and Systems, their properties and the classifications in the contest of communication and signal processing.

SENSORS & TRANSDUCERS

Students will be able to

1. Understand applications of various transducers in industry.
2. Analyze measurement systems, errors of measurement .
3. Understand the working principle of displacement transducers and their applications

DIGITAL SIGNAL PROCESSING

Students are able to

1. Recognize the fundamentals of fixed and floating point architectures of various DSPs.
2. Analyze and learn to implement the signal processing algorithms in DSPs.
3. Design and implement signal processing modules in DSPs.

MICROPROCESSOR & MICROCONTROLLER

Students will be able to

1. Interfacing of various Devices.
2. Test and design small projects like digital clock, display system

MOBILE COMMUNICATION

Students are able to

1. Analyze the Mobile radio propagation, fading, diversity concepts and the channel modeling.
2. Analyze Multiuser Systems, CDMA, WCDMA network planning and OFDM Concepts.
3. Summarize the principles and applications of wireless systems and standards

DIGITAL COMMUNICATION

Students are able to

1. Apply the knowledge of statistical theory of communication and explain the conventional digital communication system.
2. Describe and analyze the digital communication system with spread spectrum modulation.
3. Apply the knowledge of signals and system and evaluate the performance of digital communication system in the presence of noise.

ANTENNA & WAVE PROPAGATION

Students are able to

1. Identify basic antenna parameters.
2. Design and analyze antenna arrays.

3. Identify the characteristics of radio-wave propagation.

HIGH FREQUENCY ENGINEERING

Students are able to

1. Have an ability to analyse the structure, characteristics , operation, equivalent circuit, gain expression, output power efficiency and applications of various microwave solid state active devices.
2. Demonstrate insight to develop an ability to evaluate the performance of microwave integrated circuits by using different measurements and testing techniques.

COMMUNICATION ENGINEERING

Students are able to

1. Apply Fourier Transform in the analysis of digital communication system.
2. Apply the knowledge of statistical theory of communication and explain the conventional communication system
3. Apply the knowledge of signals and system and evaluate the performance of communication system in the presence of noise

DIGITAL SIGNAL PROCESSING

Students are able to

1. Recognize the fundamentals of fixed and floating point architectures of various DSPs.
2. Analyze and learn to implement the signal processing algorithms in DSPs.
3. Design and implement signal processing modules in DSPs.

ANALOG ELECTRONIC CIRCUIT

Students will be able to

1. Learn how to develop and employ circuit models for elementary electronic components, e.g., resistors, sources, inductors, capacitors, diodes and transistors
2. Develop the capability to analyze and design simple circuits containing non-linear elements such as transistors using the concepts of load lines.
3. Explain performance of basic class-A and class-B power amplifiers.

SIGNAL & SYSTEM

Students will be able to

1. Analyze fundamental and universal tools for the analysis of signals.
2. Use Signal Processing Techniques in Communication.
3. Apply Z transform on any discrete signal and also can relate it with the Laplace transform

DIGITAL SYSTEMS DESIGN

Students will be able to

1. Analyze and design digital combinational and sequential circuits.
2. Understand the realization of logic behavior of different systems .
3. Solve different binary codes

DIGITAL ELECTRONICS

Students will be able to

1. Convert different type of codes and number systems which are used in digital communication and computer systems.
2. Employ the codes and number systems converting circuits and Compare different types of logic families which are the basic unit of different types of logic gates.
3. Analyze and design digital combinational and sequential circuits.

MICROPROCESSOR AND MICROCONTROLLER

Students will be able to

1. Design and implement programs on 8085 microprocessor.
2. Design interfacing circuits with 8085.
3. To Understand the concepts related to I/O and memory interfacing

DIGITAL SYSTEMS DESIGN

Students will be able to

1. Introduce the concept of digital and binary systems
2. Be able to design and analyze combinational logic circuits.
3. Be able to design and analyze sequential logic circuits.

DIGITAL SIGNAL PROCESSING

Students will be able to

1. Analyze and learn to implement the signal processing algorithms in DSPs.
2. Recognize the fundamentals of fixed and floating point architectures of various DSPs.
3. Design and implement signal processing modules in DSPs

BASIC ELECTRONICS

Students will be able to

1. Employ the concept of Energy Band Theory and Fermi Levels to explain the operating principle of semiconductors.

2. Distinguish between conductors, nonconductors and semiconductors based on energy band theory and classify different types of semiconductors.

3. Compute different parameters for characterizing different circuits like rectifiers, regulators etc. using diodes and BJTs.

B.TECH (ELECTRICAL & ELECTRONICS ENGINEERING)

BASIC ELECTRICAL ENGIINEERING

Students will be able to

1. An ability to identify, formulates, and solves Electrical engineering circuit problems.
2. An ability to analyze the difference between AC & DC Machines.
3. Enable to conceptualize Transmission & Distribution System.
4. Develop a basic knowledge about Single phase and Three-phase AC Circuit.
5. Graduate will able to analyze real life problems related to electricity and will provide technically sound, economically and socially viable solutions

NETWORK THEORY

Students will be able to

1. Analyze simple DC circuits.
2. Find Thevenin and Norton equivalents of circuits.
3. Analyze AC steady-state responses and transient response of resistance, inductance and capacitance in terms of impedance.
4. Analyze two port networks

POWER ELECTRONICS

Students will be able to

1. Ability to study of basic concepts on power semiconductor devices like Thyristors, MOSFET, IGBT.
2. Ability to study the different types of power converters.

3. Ability to study the different types of INVERTER.

4. Able to apply power electronics concept to solve problems in low energy engineering applications.

ELECTROMAGNETIC FIELD THEORY

Students will be able to

1. Apply vector calculus to static electric magnetic fields in different engineering situations.
2. Analyze Maxwell's equation in different forms (differential and integral) and apply them to diverse engineering problems.
3. Examine the phenomena of wave propagation in different media and its interfaces and in applications of microwave engineering.
4. Analyze the nature of electromagnetic wave propagation in guided medium which are used in microwave applications.

ELECTRICAL MACHINES – I

Students will be able to

1. Have knowledge of various parts of a electrical machine.
2. Able to conduct open circuit/ short circuit test on transformer.
3. Ability to conduct experiments on Ac Machines to find the characteristics.
4. Develop knowledge helpful for higher studies.

RENEWABLE ENERGY SOURCES

Students will be able to

1. Able to understand the importance and application of Biomass power.

2. Able to know the application of renewable energy sources.
3. Able to understand the different types of renewable energy sources.

CONTROL SYSTEM ENGINEERING

Students will be able to

1. Understand the properties of feedback and feed-forward control architecture and specify control architecture for a real world problem.
2. Understand the importance of performance, robustness and stability in control design.
3. Have a strong intuitive understanding of the link between the ODE representation, the s-domain representation and physical characteristics of the time response of an LTI SISO system.
4. Identify simple systems and dominant response characteristics from time domain step-response data.
5. Work confidently with block diagram representations of control systems.
6. Design PID controllers based on empirical tuning rules.

ELECTRICAL & ELECTRONICS MEASUREMENT

Students will be able to

1. Recognize the evolution and history of units and standards in Measurements.
2. Identify the various parameters that are measurable in electronic instrumentation.
3. Employ appropriate instruments to measure given sets of parameters.
4. Practice the construction of testing and measuring set up for electronic systems.
5. To have a deep understanding about instrumentation concepts which can be applied to Control systems.
6. Relate the usage of various instrumentation standards.

ELECTRICAL MACHINES – II

Students will be able to

1. Illustrate constructional features of synchronous machines, winding details, induce EMF.
2. Develop phasor diagram & examine steady state performance of synchronous machines, determine voltage regulation of an alternator.
3. Interpret parallel operation of alternators & determine various sequence reactances of synchronous machines.
4. Analyze the behavior of synchronous machine connected to infinite bus.
5. Explain transient behavior of synchronous machines & determination of time constant and equivalent circuit parameters under transient conditions.

HVDC

Students will be able to

1. Students will be able to understand the importance of Transmission power through HVDC.
2. Ability to calculate power conversion between Ac to DC and DC to AC.
3. Ability to discuss 6 pulse,12 pulse circuits.
4. Ability to discuss firing angle control.
5. Ability to control reactive power through HVDC.
6. Ability to discuss power flow analysis HVDC.
7. Ability to discuss protection of HVDC.

CONTROL SYSTEM II

Students will be able to

1. Illustrate the need for compensation, classify & evaluate various compensation techniques.
2. Outline the state variable approach ,analyze STM & analyze state equation.
3. Design & develop state variable feedback process and its effect on controllability & observability.

4. Analyze, design of optimal control with & without constraints.
5. Describe & analyze common non- linearity's and examine non-linear stability.

POWER SYSTEM & OPERATION CONTROL

Students will be able to

1. To make students understand Economic operation of power system and importance of LFC control.
2. To allow students discuss about thermal and hydro power plants operation in meeting the load demand optimally. (State and central wide installation).Also expressing importance of reactive power control through seminars).
3. To improve student's ability in solving problems (numerical problems at present) by posing different problem models related to Economic Load Dispatch, Load Frequency Control and reactive power control.
4. Apply their knowledge in PSOC for competitive exams like GATE, IES, and Public sector etc.
5. Ability to discuss single area load frequency control and two area load frequency control.

ELECTRICAL DRIVES

Students will be able to

1. Understand the law of demand and factors of production.
2. Students will be familiar with market competition and price determination.
3. Understand the functions of banks and taxes.
4. Students will be aware of management skills at professional level.
5. Students will get acquainted with knowledge of marketing strategies.

FACTS

Students will be able to

1. At the end of the course student will be able to apply the modeling concept .
2. Students will be equipped with stability analysis of linear and non linear systems.

SGPD

Students will be able to

1. Describe basic terminology of Protective Relaying, different types of faults and components used in Power System protection.
2. Describe and Design the Over current Protection schemes used for Medium Voltage Line .
3. 3 Differentiate and Describe various distance protection schemes used for High Voltage line.
4. Explain differential protection as applicable to bus bars, transformers, alternators, motors and Employ suitable protection scheme for various abnormal and faulty conditions.
5. Describe and Differentiate Static Relays with Electromechanical Relays.

AUTOMOBILE ENGINEERING

Students will be able to

1. Identify the different parts of the automobile
2. Explain the working of various parts like engine, transmission, clutch, brakes
3. Describe how the steering and the suspension systems operate.
4. Understand the environmental implications of automobile emissions
5. Develop a strong base for understanding future developments in the automobile industry

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8. Describe how the steering and the suspension systems operate.
9. Understand the environmental implications of automobile emissions
10. Develop a strong base for understanding future developments in the automobile industry

B.TECH (MECHANICAL ENGINEERING)

BASIC MECHANICAL ENGINEERING

At the end of the course, the students will be able to:

1. Understand the energy sources and working principle of power plants and apply the knowledge of power plants to diagnose and solve the Engineering problem.
2. Understand the working principle of IC Engines and also has ability to demonstrate working principles of petrol and diesel engine.
3. Understand the function of refrigeration and air conditioning system.
4. An ability to identify, formulate and solve engineering problems.

ENGINEERING MECHANICS

At the end of the course, the students will be able to:

1. Relative motion. Inertial and non inertial reference frames.
2. Parameters defining the motion of mechanical systems and their degrees of freedom.
3. Study of the interaction of forces between solids in mechanical systems.
4. Centre of mass and inertia tensor of mechanical systems.

ENGINEERING THERMODYNAMICS

At the end of the course, the students will be able to:

1. Classify various types of Engines, Compare Air standard, Fuel Air and Actual cycles and make out various losses in real cycles.
2. Understand Theory of Carburetion, Modern Carburetor, Stages of Combustion in S. I. Engines and Theory of Detonation, Pre-ignition and factors affecting detonation.
3. Understand Fuel Supply system, Types of Injectors and Injection Pumps, Stages of Combustion in CI Engines, Theory of Detonation in CI Engines and Comparison of SI and CI Combustion and Knocking and Factors affecting, Criteria for good combustion chamber and types.
4. Carry out Testing of I. C. Engines and analyze its performance.

INTRODUCTION TO PHYSICAL METALLURGY AND ENGINEERING MATERIALS

At the end of the course, the students will be able to

1. describe how metals and alloys formed and how the properties change due to microstructure
2. apply core concepts in Engineering Metallurgy to solve engineering problems
3. 3.conduct experiments, as well as to analyze and interpret data
4. select materials for design and construction.

FLUID MECHANICS AND HYDRAULIC MACHINES

At the end of the course, the students will be able to

1. Use of various properties in solving the problems in fluids
2. Use of Bernoulli's equation for solutions in fluids
3. Determination of forces drag and lift on immersed bodies

KINEMATICS AND DYNAMICS OF MACHINES

At the end of the course, the students will be able to

1. Identify mechanisms in real life applications.
2. Perform kinematic analysis of simple mechanisms.
3. Perform static and dynamic force analysis of slider crank mechanism.
4. Determine moment of inertia of rigid bodies experimentally.

MECHANICS OF SOLID

At the end of the course, the students will be able to

1. Design and conduct experiments, as well as to analyze and interpret data
2. Design a component to meet desired needs within realistic constraints of health and safety
3. Identify, formulate, and solve engineering problems
4. Practice professional and ethical responsibility

BASIC MANUFACTURING PROCESS

At the end of the course, the students will be able to

1. Ability to identify, formulate and solve technical problems.
2. Ability to use computational methods, skills, computers and modern technical tools in engineering practice.
3. Ability to design and conduct experiments, and to analyze and interpret data.
4. Ability to design a system, component or process to meet desired needs.

INTERNAL COMBUSTION ENGINES AND GAS TURBINES

At the end of the course, the students will be able to

1. Cogeneration Performance criteria, sizing and influence of atmospheric conditions. Gas exchange processes, supercharging and turbocharging. Formation, characteristics, vaporization and combustion of sprays. Combustion in Spark-Ignition and Compression-Ignition engines.
2. Classical and alternative fuels P-theta and P-V diagrams - Heat release rate.Pollutant formation and control: NOx, CO, HC etc. particulates.Engine heat transfer and cooling systems.

MECHANISMS AND MACHINES

At the end of the course, the students will be able to

1. Distinguish kinematic and kinetic motion.
2. Identify the basic relations between distance, time, velocity, and acceleration.
3. Apply vector mechanics as a tool for solving kinematic problems.
4. Create a schematic drawing of a real-world mechanism.

MECHANICAL MEASUREMENT, METROLOGY & RELIABILITY

At the end of the course, the students will be able to

1. 1.Explain the basics of standards of measurement, limits, fits & tolerances industrial applications.
2. 2.Identify the uses of gauges and comparators
3. 3.Understand the significance of measurement system, errors, transducers, intermediate modifying and terminating devices
4. 4.Interpret measurement of field variables like force, torque and pressure

DESIGN OF MACHINE ELEMENTS

At the end of the course, the students will be able to

1. Understand the fundamental scientific principles of mechanical design (stress, strain, material properties, failure theories, fatigue phenomena, fracture mechanics) and their importance and use in design analysis
2. Develop practical experience with the function, design and analysis of actual machine components including prediction of their life and failure
3. Practice systematic approaches to mechanical design and analysis procedures.

HEAT TRANSFER

At the end of the course, the students will be able to

1. Understand the basic laws of heat transfer.
2. Account for the consequence of heat transfer in thermal analyses of engineering systems.
3. Analyze problems involving steady state heat conduction in simple geometries.
4. Develop solutions for transient heat conduction in simple geometries.

MACHINING SCIENCE AND TECHNOLOGY

At the end of the course, the students will be able to

1. Ability to identify, formulate and solve technical problems.
2. Ability to use computational methods, skills, computers and modern technical tools in engineering practice.
3. Ability to design and conduct experiments, and to analyze and interpret data.
4. Ability to design a system, component or process to meet desired needs.

AUTOMOBILE ENGG

At the end of the course, the students will be able to

1. Identify the different parts of the automobile

2. Explain the working of various parts like engine, transmission, clutch, brakes
3. Describe how the steering and the suspension systems operate.
4. Understand the environmental implications of automobile emissions

PRODUCT DESIGN AND PRODUCTION TOOLING

At the end of the course, the students will be able to

1. 1.Apply the principles of product design to modify existing engineering systems or to develop new artifacts.
2. 2.Design a system taking into consideration the concepts of ease of production, maintenance, handling installation etc.
3. 3.Translate the concepts of economics in design, optimization of design and human factors approach to product design.

PRODUCTION AND OPERATION MANAGEMENT

At the end of the course, the students will be able to

1. Identify the elements of operations management and various transformation processes to enhance productivity and competitiveness.
2. Analyze and evaluate various facility alternatives and their capacity decisions, develop a balanced line of production & scheduling and sequencing techniques in operation environments
3. Develop aggregate capacity plans and MPS in operation environments.
4. Plan and implement suitable materials handling principles and practices in the operations.

REFRIGERATION AND AIR CONDITIONING

At the end of the course, the students will be able to

1. Understand the application of thermodynamics and heat transfer in various types of refrigeration system .i.e. Vapor compression, vapor absorption system.
2. Understand the applications of air conditioning and calculation of psychometric properties of weather.
3. Understand the applications of air conditioning, namely: In industrial, such as in textiles, printing, manufacturing, photographic, computer rooms, power plants, vehicular etc.

ROBOTICS

At the end of the course, the students will be able to

1. 1.The student must be able to design automatic manufacturing cells with robotic control using the principle behind robotic drive system, end effectors, sensor, machine vision robot kinematics and programming.
2. 2.Explain the basic concepts of working of robot analyze the function of sensors in the robot Write program to use a robot for a typical application Use Robots in different applications.

MECHANICAL VIBRATION

At the end of the course, the students will be able to

1. Apply Newton's equation of motion and energy methods to model basic vibrating mechanical systems
2. Model reciprocating and oscillatory motions of mechanical systems
3. Model undamped and damped mechanical systems and structures
4. Model free and harmonically forced vibrations

FATIGUE CREEP AND FRACTURE

At the end of the course, the students will be able to

1. Grasp the basic of the fatigue
2. Understand the inter relationship between processing, microstructures and mechanical performance.
3. Learn how to design durable and damage tolerant products
4. Learn how to enhance product performance through fatigue design and analysis

COURSE OUTCOMES OF M.TECH

M.TECH (COMMUNICATION SYSTEMS)

COMPUTATIONAL METHODS AND TECHNIQUES

Students are able to

1. Use computational methods to solve problems by step-wise, repeated and iterative solution methods.
2. Use Linear systems and algebraic equations to design mathematical tools for system.
3. Use ODE in research work.

INTERNET OF THINGS

Students will be able to

1. Explore to the interconnection and integration of the physical world and the cyber space.
2. They are also able to design & develop IOT Devices.
3. Able to understand building blocks of Internet of Things and characteristics

INTEGRATED CIRCUIT DESIGN

Students will be able to

1. Apply knowledge of mathematics, science, and engineering to design and analysis of analog integrated circuits.
2. Identify, formulates, and solves engineering problems in the area of analog integrated circuits.

ADVANCED COMMUNICATION TECHNIQUES

Students will be able to

1. Understand Signal and Systems, their properties and the classifications in the contest of communication and signal processing.
2. Describe and analyze the digital communication system with spread spectrum modulation.

3. Apply the knowledge of signals and system and evaluate the performance of digital communication system in the presence of noise.

ADVANCED TECHNIQUES IN SIGNAL PROCESSING

Students will be able to

1. Design and Analyze the digital filters.
2. Acquire the basics of multi rate digital signal processing.

3. Analyze the power spectrum estimation

TELECOMMUNICATION NETWORK AND OPTICAL SWITCHING

Students will be able to

1. Describe and apply fundamentals of telecommunication systems and associated technologies.
2. Apply the principles of queuing theory in evaluating the performance of congested telecommunication networks.

3. Understand and explain the reasons for switching, and the relative merits of the possible switching modes, e.g. packet and circuit switching.

SATELLITE COMMUNICATION SYSTEM

Students will be able to

1. Able to learn the dynamics of the satellite.

2. Able to understand the communication satellite design.

3. Able to understand how analog and digital technologies are used for satellite communication networks.

INDUSTRIAL TELEMATICS

Students will able to

1. Describe the functions of each layer in OSI and TCP/IP model.
2. Explain the functions of Application layer and Presentation layer paradigms and Protocols.

3. Describe the Session layer design issues and Transport layer services.

WIRELESS AND MOBILE COMMUNICATION

Students will able to

1. Analyze the radio channel characteristics and the cellular principle.
2. Analyze the measures to increase the capacity in GSM systems- sectorization and Spatial Filtering for Interference Reduction.
3. Ability to analyze improved data services in cellular communication

FIBRE-OPTICS COMPONENTS AND DEVICE

Students will able to

1. Recognize and classify the structures of Optical fiber and types.
2. Discuss the channel impairments like losses and dispersion.

3. Classify the Optical sources and detectors and to discuss their principle

RESEARCH METHODOLOGY

Students will able to

1. Know Steps in conducting research.
2. Design the criteria for selecting a problem.
3. Write Research Articles.

INTELLECTUAL PROPERTY RIGHTS

Students will able to

1. They get awareness of acquiring the patent and copyright for their innovative works.
2. Get the knowledge of plagiarism in their innovations.
3. Ethics of Research.

M.TECH (COMPUTER SCIENCE ENGINEERING)

COMPUTATIONAL METHODS AND TECHNIQUES

Students are able to

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DISTRIBUTED OPERATING SYSTEM

Students will able to

1. Potential benefits of distributed systems.
2. Summarize the major security issues associated with distributed systems along with the range of techniques available for increasing system security.
3. Apply standard design principles in the construction of these systems

MACHINE LEARNING

Students will able to

1. Conceptualization and summarization of big data and machine learning, trivial data versus big data, big data computing technologies, machine learning techniques.
2. Scaling up machine learning approaches.

DATA WAREHOUSE AND DATA MINING

Students will able to

1. Learn to organize and prepare the data needed for data mining using pre preprocessing techniques.
2. Understand data mining principles and techniques.
3. Describing and demonstrating basic data mining algorithms, methods, and tools

CLOUD COMPUTING

Students will able to

1. Define different Cloud service and deployment models.
2. Describe importance of virtualization along with their technologies.
3. Describe the key components of Amazon web Service.

WIRELESS SENSOR NETWORK

Students will able to

1. Explain the basic concepts of wireless network and wireless generations.
2. Demonstrate the different wireless technologies such as CDMA, GSM, GPRS etc

BIG DATA ANALYTIC

Students will able to

1. Explain the motivation for big data systems and identify the main sources of Big Data in the real world.
2. Demonstrate an ability to use frameworks like Hadoop, NOSQL to efficiently store retrieve and process Big Data for Analytics.

MOBILE COMPUTING

Students will able to

1. Apply the fundamental design paradigms and technologies to mobile computing applications.
2. Develop consumer and enterprise mobile applications using representative mobile devices and platforms using modern development methodologies.

CRYPTOGRAPHY

Students will able to

1. Overview about information security, which includes an overview of public and secret key cryptosystems.
2. Comprehend and apply authentication services and mechanisms

GRAPH THEORY

Students will able to

1. Apply principles and concepts of graph theory in practical situations

ADVANCE COMPUTER ARCHITECTURE

Students will able to

1. Basic organization of computer and the architecture of 8086 microprocessor.
2. Implement assembly language program for given task for 8086 microprocessor.
3. Identify and compare different methods for computer I/O mechanisms.

ADVANCE OPERATING SYSTEM

Students will able to

1. Analyze the structure of OS and basic architectural components involved in OS design.
2. Analyze and design the applications to run in parallel either using process or thread models of different OS, analyze the various device and resource management techniques for timesharing and distributed systems.
3. Understand the Mutual exclusion, Deadlock detection and agreement protocols of Distributed operating system.
4. Interpret the mechanisms adopted for file sharing in distributed applications.

M.TECH (POWER SYSTEM ENGINEERING)

COMPUTATIONAL METHODS AND TECHNIQUES

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ELECTRICAL POWER SYSTEM TRANSIENT

Students will able to

1. Identify and explain the different methods of generation, distribution, control and compensation involved in the operation of power systems.
2. Design the mathematical models of the mechanical and electrical components involved in the operation of power systems and demonstrate the understanding of the open loop and closed loop control practices associated with the voltage and frequency control of single area or interconnected multi area power systems.
3. Specify the equivalent electrical parameters of transmission line to prepare and analyze models to predict the range and ratings of the equipments to be used, the protection required against line transients and determine the appropriate methods of compensation required for operational stability.

4. Solve the problems related to the economic dispatch of power, plant scheduling, unit commitment and formulate strategies to minimize transmission line losses and penalties imbibed.

5. Devise protection schemes required for the system to safeguard against transients after identifying and determining the severity of the transients occurring during the period of operation and design testing strategies to determine the performance characteristics of the compensating equipment to be used in the system.

POWER SYSTEM DYNAMICS

Students will able to

1. Understand and analyze mathematical models applied in studying dynamic response and stability of electrical power systems.

2. Comprehend and finally master modern computational tools for power system dynamic analysis.

3. Perform small-size power system dynamic studies using modern computational tools in MATLAB.

HVDC TRANSMISSION AND FACTS

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4. Analyze, design of optimal control with & without constraints.
5. Describe & analyze common non- linearity's and examine non-linear stability.

GREEN ENERGY RESOURCES & TECHNOLOGY

Students will able to

1. Describe the environmental aspects of non-conventional energy resources. In Comparison with various conventional energy systems, their prospects and limitations.
2. Know the need of renewable energy resources, historical and latest developments.
3. Describe the use of solar energy and the various components used in the energy production with respect to applications like - heating, cooling, desalination, power generation, drying, cooking etc.
4. Appreciate the need of Wind Energy and the various components used in energy generation and know the classifications.
5. Understand the concept of Biomass energy resources and their classification, types of biogas Plants- applications.

POWER CONVERSION DEVICES AND DRIVES

Students will able to

1. Understand the law of demand and factors of production.
2. Students will be familiar with market competition and price determination.

3. Understand the functions of banks and taxes.

4. Ability to study of basic concepts on power semiconductor devices like Thyristors, MOSFET, IGBT.

5. Ability to study the different types of power converters.

ADVANCED POWER SYSTEMS

Students will able to

1. To make students understand Economic operation of power system and importance of LFC control.

2. To allow students discuss about thermal and hydro power plants operation in meeting the load demand optimally. (State and central wide installation).Also expressing importance of reactive power control through seminars).
3. To improve student's ability in solving problems (numerical problems at present) by posing different problem models related to Economic Load Dispatch, Load Frequency Control and reactive power control.

4. Apply their knowledge in PSOC for competitive exams like GATE, IES, and Public sector etc.

5. Ability to discuss single area load frequency control and two area load frequency control.

M.TECH (STRUCTURAL ENGINEERING)

COMPUTATIONAL METHODS AND TECHNIQUES

Students are able to

1. Use computational methods to solve problems by step-wise, repeated and iterative solution methods.
2. Use Linear systems and algebraic equations to design mathematical tools for system.
3. Use ODE in research work.

INTERNET OF THINGS

Students will be able to

1. Explore to the interconnection and integration of the physical world and the cyber space.
2. They are also able to design & develop IOT Devices.
3. Able to understand building blocks of Internet of Things and characteristics

FINITE ELEMENT METHOD IN CIVIL ENGINEERING

Students will be able to

1. Implement numerical methods to solve mechanics of solids problems.
2. Formulate and Solve axially loaded bar Problems.
3. Formulate and analyze truss and beam problems.
4. Implement the formulation techniques to solve two-dimensional problems using triangle and quadrilateral elements.
5. Formulate and solve Axi-symmetric and heat transfer problems.

THEORY OF ELASTICITY AND PLASTICITY

Students will be able to

1. The students shall be able to demonstrate the application of plane stress and plane strain in a given situation.
2. The student will demonstrate the ability to analyze the structure using plasticity.
3. To impart the knowledge of stress-strain relations for linearly elastic solids, and Torsion.

ENVIRONMENTAL IMPACT ASSESSMENT AND AUDITING

Students will be able to

1. Knowledge on prediction and assessment of environmental impacts due to developmental activities.
2. Concepts on various environmental impact assessment methodologies.
3. An outlook on legislations to safeguard environment.

ADVANCED REINFORCED CONCRETE DESIGN

Students will be able to

1. Estimate the crack width and deflection with regard to the serviceability.
2. Analyse and design a grid floor system.
3. Analyse and design a flat slab system.
4. Discuss fire and seismic resistance of concrete structures.
5. Analyse and design bunkers, silos and chimneys.

MATRIX METHODS OF ANALYSIS OF STRUCTURE

Students will be able to

1. knowledge of development of stiffness matrix for prismatic members
2. knowledge of matrix computations
3. ability to analyze determinate and indeterminate plane and space truss / frame system.

ADVANCED STEEL STRUCTURE

Students will be able to

1. Understanding of the ASD and LRFD design philosophies and behavior of structural steel
2. Ability to analyze and design of tension members
3. Ability to analyze and design of columns
4. Ability to analyze and design of beams
5. Ability to analyze and design of beam-columns
6. Ability to analyze and design of simple bolted and welded connections

ADVANCE CONSTRUCTION MATERIALS

Students will be able to

1. understanding of the composition, microstructure, and engineering behavior of various materials used in civil engineering applications.

NON-CONVENTIONAL ENERGY

Students will be able to

1. Demonstrate the generation of electricity from various Non-Conventional sources of energy, have a working knowledge on types of fuel cells.

2. Estimate the solar energy, Utilization of it, Principles involved in solar energy collection and conversion of it to electricity generation.
3. Explore the concepts involved in wind energy conversion system by studying its components, types and performance.
4. Illustrate ocean energy and explain the operational methods of their utilization.
5. Acquire the knowledge on geothermal energy.

M.TECH (PRODUCTION ENGINEERING)

PRODUCTION TECHNOLOGY

At the end of the course, the students will be able to

1. Recognize the different types of casting process.
2. Select suitable manufacturing process for typical components.
3. Describe the various welding process.
4. Explain the concept of forging, rolling process and drawing.

QUANTITATIVE TECHNIQUES IN PRODUCTION MANAGEMENT

At the end of the course, the students will be able to

1. Identify the elements of operations management and various transformation processes to enhance productivity and competitiveness.
2. Analyze and evaluate various facility alternatives and their capacity decisions, develop a balanced line of production & scheduling and sequencing techniques in operation environments
3. Develop aggregate capacity plans and MPS in operation environments.
4. Plan and implement suitable materials handling principles and practices in the operations.

QUALITY ASSURANCE

At the end of the course, the students will be able to

1. To realize the importance of significance of quality
2. Manage quality improvement teams
3. Identify requirements of quality improvement programs

RAPID PROTOTYPING AND TOOLING

At the end of the course, the students will be able to

1. Describe product development, conceptual design and classify rapid prototyping systems; explain stereo lithography process and applications

2. Explain direct metal laser sintering, LOM and fusion deposition modeling processes
3. Demonstrate solid ground curing principle and process
4. Discuss LENS, BPM processes; point out the application of RP system in medical field define virtual prototyping and identify simulation components

THEORY OF PLASITCITY AND DEFORMATION

At the end of the course, the students will be able to

1. Apply the theory of plasticity and its application for analyzing various metal formingProcesses Describe the advancement in forming technologies

ALTERNATIVE ENERGY

At the end of the course, the students will be able to

1. The research and teaching aim to provide you with a solid foundation for developing the use of renewable energy systems in society.
2. The study is suitable for those who wish to work with renewable energy systems. After completing a master in renewable energy systems, you have achieved:

CAD & CIM

At the end of the course, the students will be able to

1. Define the principles of optimum design
2. Apply surface modelling techniques
3. Analyze production systems at operation level

COMPOSITE MATERIAL

At the end of the course, the students will be able to

1. Explain the mechanical behavior of layered composites compared to isotropic materials.
2. Apply constitutive equations of composite materials and understand mechanical behavior at micro and macro levels.
3. Determine stresses and strains relation in composites materials.

METROLOGY

At the end of the course, the students will be able to

1. Students will be able to design tolerances and fits for selected product quality. T
2. They can choose appropriate method and instruments for inspection of various gear elements and thread elements.
3. They can understand the standards of length, angles, they can understand the evaluation of surface finish and measure the parts with various comparators.
4. The quality of the machine tool with alignment test can also be evaluated by them.

NON-TRADITIONAL MANUFACTURING PROCESSES

At the end of the course, the students will be able to

1. Select suitable machining process for suitable materials
2. Select optimum parameters for the respective machining process
3. Summarizes the merits and demerits of the non-traditional manufacturing process

HUMAN RESOURCE MANAGEMENT

At the end of the course, the students will be able to

1. To develop the understanding of the concept of human resource management and to understand its relevance in organizations.
2. To develop necessary skill set for application of various HR issues.
3. To analyse the strategic issues and strategies required to select and develop manpower resources.
4. To integrate the knowledge of HR concepts to take correct business decisions

COURSE OUTCOMES OF MCA

PROGRAMMING IN C

Students will be able to

1. Illustrate the flowchart and design an algorithm for a given problem and to develop IC programs using operator.
2. Develop conditional and iterative statements to write C programs. Inscribe C programs that use Pointers to access arrays, strings and functions.

COMPUTER APPLICATION AND ARCHITECTURE

Students will be able to

1. Explain the organization of basic computer, its design and the design of control unit.
2. Demonstrate the working of central processing unit and RISC and CISC Architecture.
3. Describe the operations and language of the register transfer, micro operations and input- output organization.
4. Understand the organization of memory and memory management hardware.

DATA STRUCTURE USING C

Students will be able to

1. Choose appropriate data structure as applied to specified problem definition.
2. Handle operations like searching, insertion, deletion, traversing mechanism etc. on various data structures.

3. Apply concepts learned in various domains like DBMS, compiler construction etc.
4. Use linear and non-linear data structures like stacks, queues, linked list etc.

OBJECT ORIENTED PROGRAMMING USING C++

Students will be able to

1. Use the characteristics of an object-oriented programming language in a program.
2. Use the basic object-oriented design principles in computer problem solving.
3. Use the basic principles of software engineering in managing complex software project.
4. Program with advanced features of the C++ programming language. Develop programs in the UNIX programming environment

OPERATING SYSTEM

Students will be able to

1. Compare the various algorithms and comment about performance of various algorithms used for management of memory, CPU scheduling, File handling and I/O operations.
2. Apply various concept related with Deadlock to solve problems related with Resources allocation, after checking system in Safe state or not.

DESIGN ANALYSIS AND ALGORITHM

Students will be able to

1. Argue the correctness of algorithms using inductive proofs and invariants.
2. Analyze worst-case running times of algorithms using asymptotic analysis.
3. Describe the divide-and-conquer paradigm and explain when an algorithmic design situation calls for it. Recite algorithms that employ this paradigm.
4. Synthesize divide-and-conquer algorithms.
5. Derive and solve recurrences describing the performance of divide-and-conquer algorithms.

THEORY OF COMPUTATION

Students will be able to

1. Understand the basic concepts of formal languages, automata and grammar types, as well as the use of formal languages and reduction in normal forms, relation between regular expressions, automata, languages and grammar with formal mathematical methods, design push down automata, cellular automata and turing machines

COMPUTER NETWORKS

Students will be able to

1. Describe the functions of each layer in OSI and TCP/IP model.
2. Classify the routing protocols and analyze how to assign the IP addresses for the given network.
3. Define various examples of wireless communication system, standards related to 2G and 3G wireless networks.

DATABASE MANAGEMENT SYSTEM

Students will be able to

1. Define database system concepts and apply normalization to the database.
2. Explain the basic processing and optimization, different transaction processing concepts and use different concurrency control techniques,

different types of database failures and techniques to recover from such failures

ADVANCE OS

Students will be able to

1. Analyze the structure of OS and basic architectural components involved in OS design.
2. Analyze and design the applications to run in parallel either using process or thread models of different OS, analyze the various device and resource management techniques for timesharing and distributed systems.
3. Understand the Mutual exclusion, Deadlock detection and agreement protocols of Distributed operating system.
4. Interpret the mechanisms adopted for file sharing in distributed Applications

PROGRAMMING WITH JAVA

Students will be able to

1. Use the Java programming language for various programming technologies ,develop software in the Java programming language, evaluate user requirements for software functionality required to decide whether the Java programming language can meet user requirements, propose the use of certain technologies by implementing them in the Java programming language to solve the given problem.

COMPUTER GRAPHICS AND MULTIMEDIA

Students will be able to

1. Understand the basics of computer graphics, different graphics systems and applications of computer graphics, various algorithms for scan conversion and filling of basic objects and their comparative analysis, extract scene with different clipping methods and its transformation to graphics display device.

SOFTWARE ENGINEERING

Students will be able to

1. Cite the knowledge of students to document a software system, to descried the functional and non functional requirements.
2. Categorize different components used in the software system.
3. Improve quality of software by selecting proper architecture.

COMPILER DESIGN AND LANGUAGE PROCESSOR

Students will be able to

1. After completion of this course each student will implement a compiler for a small programming language.

ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEM

Students will be able to

1. Understand the various searching techniques, constraint satisfaction problem and example problems- game playing techniques.
2. Apply these techniques in applications which involve perception,

reasoning and learning.

3. Explain the role of agents and how it is related to environment and the way of evaluating it and how agents can act by establishing goals.
4. Acquire the knowledge of real world Knowledge representation.
5. Analyze and design a real world problem for implementation and understand the dynamic behavior of a system.

OBJECT ORIENTED ANALYSIS AND DESIGN WITH UML

Students will be able to

1. Be able to use an object-oriented method for analysis and design,
2. Analyses information systems in real-world settings and to conduct methods such as interviews and observations,
3. Know techniques aimed to achieve the objective and expected results of a systems development process, know different types of prototyping;
4. Know how to use UML for notation.

GREEN IT

Students will be able to

1. Identify IT Infrastructure Management and Green Data Centre Metrics for software development
2. Recognize Objectives of Green Network Protocols for Data communication.
3. Use Green IT Strategies and metrics for ICT development.

EMBEDDED SYSTEM

Students will be able to

1. The embedded system concepts and architecture of embedded systems, the

architecture of 8051 microcontroller and write embedded program for 8051 microcontroller.

DATA MINING AND ANALYSIS

Students will be able to

1. Learn to organize and prepare the data needed for data mining using pre preprocessing techniques.
2. Understand data mining principles and techniques.
3. Describing and demonstrating basic data mining algorithms, methods, and tools.

WIRELESS COMMUNICATION AND MOBILE COMPUTING

Students will be able to

1. Explainthe basic concepts of wireless network and wireless generations, Demonstrate the different wireless technologies such as CDMA, GSM, GPRS etc

PHP AND MY SQL

Students will be able to

1. Download, install and configure all the software required to create dynamic web site using PHP and MySql.

CRYPTOGRAPHY AND CYBER LAW

Students will be able to

1. Analyze the vulnerabilities in any computing system and hence be able to design a security solution.
2. Identify the security issues in the network and resolve it.
3. Evaluate security mechanisms using rigorous approaches, including

theoretical compare and Contrast different IEEE standards and electronic mail security

CLOUD COMPUTING

Students will be able to

1. Define different Cloud service and deployment models.
2. Describe importance of virtualization along with their technologies.
3. Describe the key components of Amazon web Service.

DOT NET PROGRAMMING

Students will be able to

1. Design web applications using ASP.NET
2. use ASP.NET controls in web applications,
3. debug and deploy ASP.NET web applications
4. create database driven ASP.NET web applications and web services.

PARALLEL COMPUTING

Students will be able to

1. Familiar with the wide applicability of graph theory and tree algorithms as an abstraction for the analysis of many practical problems, efficient parallel algorithms related to many areas of computer science.

MICROPROCESSOR AND ASSEMBLY LEVEL LANGUAGE

Students will be able to

1. Understand and classify the instruction set of 8085 microprocessor and distinguish the use of different instructions and apply it in assembly

language programming.

2. Understand the architecture and operation of Programmable Interface Devices and realize the programming & interfacing of it with 8085 microprocessor.

SOFT COMPUTING

Students will be able to

1. Understand basics of fuzzy system, genetic algorithms & their relations.
2. Apply genetic algorithms & artificial neural network as computation tools to solve a variety of problems in various areas of interest ranging from optimization problems to text analytics.