Computer Engineering

Program outcomes

At the end of the program, a student will be able to:

1. Apply the knowledge of Mathematics, Science and Engineering Fundamentals to solve complex Computer Engineering Problems.
2. Identify, formulate and analyze Computer Engineering Problems and derive conclusion using First Principle of Mathematics, Engineering Science and Computer Science.
3. Investigate Complex Computer Engineering problems to find appropriate solution leading to valid conclusion.
4. Design a software System, components, Process to meet specified needs with appropriate attention to health and Safety Standards, Environmental and Societal Considerations.
5. Create, select and apply appropriate techniques, resources and advance Engineering software to analyze tools and design for Computer Engineering Problems.
6. Understand the Impact of Computer Engineering solution on society and environment for Sustainable development.
7. Understand Societal, health, Safety, cultural, Legal issues and Responsibilities relevant to Engineering Profession.
8. Apply Professional ethics, accountability and equity in Engineering Profession.
9. Work effectively as a member and leader in multidisciplinary team for a common goal.
10. Communicate effectively within a Profession and Society at large.
11. Appropriately incorporate principles of Management and Finance in one's own Work.
12. Identify educational needs and engage in lifelong learning in a Changing World of Technology.

Program specific outcomes

- Formulate and analyze complex engineering problems in computer engineering (Networking/Big data/ Intelligent Systems/Cloud Computing/Real time systems)
- Plan and develop efficient, reliable and secure system and customized application software using cost effective emerging software tools ethically

Electronics and Telecommunication Engineering

Program outcomes

At the end of the program, a student will be able to:

- Apply the knowledge of Mathematics, Science and Engineering fundamentals to solve complex Electronics and telecommunication engineering Problems.
- Identify, formulate and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics and engineering sciences.
- Investigate complex Electronics and telecommunication engineering problems and find appropriate solution leading to valid conclusion.
- Design an electronic system or process to meet specified needs with appropriate attention to health, safety, standards, environmental and societal considerations.
- Create, select and apply appropriate techniques, resources, advanced engineering and software tools necessary to analyze and design telecommunication engineering problems.
- Understand the impact of Electronics and telecommunication Engineering solutions on society and environment for sustainable development.
- Understand societal, health, safety, cultural and legal issues and responsibilities relevant to engineering profession.
- Apply professional ethics, accountability and equity in engineering profession.
- Work effectively as a member and leader in multidisciplinary team for a common goal.
- Communicate effectively within a profession and society at large.
- Appropriately incorporate principles of management and finance in one's own work.
- Identify educational needs and engage in lifelong learning in a changing world of technology.

Program specific outcomes

1. Identify, understand, formulate and analyze the complex engineering problems in communication engineering, signal processing, Embedded systems and electronics engineering.
2. Plan and execute efficient, safe, sustainable and cost-effective development of Electronic circuits, Antennas, televisions, RADAR, satellite and optical fiber systems using modern tools ethically.

Civil Engineering

Program outcomes

At the end of the program, a student will be able:

- Apply the knowledge of mathematics, science and engineering fundamentals to solve complex civil engineering problems.
- Identify, formulate and analyse civil engineering problems and derive conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- Investigate complex civil engineering problems and find appropriate solution leading to valid conclusions.
- Design a civil engineering system, component, or process to meet specified needs with appropriate attention to health, safety, standards, environmental and societal considerations.
- Create, select and apply appropriate techniques, resources, and advanced engineering and software tools necessary to analyse and design civil engineering problems.
- Understand the impact of Civil engineering solutions on society and environment for sustainable development.
- Understand societal, health, safety, cultural and legal issues and responsibilities relevant to engineering profession.
- Apply professional ethics, accountability and equity in engineering profession.
- Work effectively as a member and leader in multidisciplinary teams for a common goal.
- Communicate effectively with in a profession and society at large.
- Appropriately incorporate principles of management and finance to one’s own work.
- Identify educational needs and engage in lifelong learning in a changing world of technology.

Program specific outcomes

- Identify, understand, formulate and analyze complex engineering problems in Civil Engineering such as Structural, Environmental and Water Resources Engineering.
- Plan, design and execute efficient safe, sustainable and cost effective high-rise structures, bridges, expressways, offshore structures and dams using modern construction tools and techniques ethically.

Mechanical Engineering

Program outcomes

At the end of the program, a student will be able to:

- Apply Knowledge of mathematics, science and Engineering fundamentals to solve complex mechanical engineering problems
- Identity, formulate and analyze and mechanical engineering problems and derive conclusion using first principle of mathematics and engineering sciences.
- Able to investigate of complex mechanical engineering problems & find appropriate solution leading to valid conclusion
- Design Mechanical system, component and process to meet specified needs with appropriate attention to health, safety, standards, environmental and societal considerations.
- Create, select, apply an appropriate techniques, resource and advance engineering software tools to analyze& design mechanical engineering problems
- Understand the input of mechanical engineering solution on socially and environment for sustainable development.
- Able to understand societal, safely, cultural and legal issues & responsibilities relevant to engineering profession.
- Apply professional ethics, accountability and equity in engineering profession.
- Work effectively as a member and leader in multi-disciplinary team for common goal
- Communicate effectively within profession and society at large
- Appropriately incorporate principals of management and finance in one's own work
- Identify educational needs and engage in lifelong learning in changing world of technology

Program specific outcomes

1. Identify, understand, formulate and analyze complex engineering problems in Design, Thermal, Management and Manufacturing of Mechanical System.
2. Plan and Execute efficient, safe, sustainable and cost effective manufacturing of IC Engines, Turbomachines, Air Conditioning systems by the use of CAD/CAM/CAE tools ethically.

Automobile Engineering

Program outcomes

- Apply knowledge of Mathematics, Science, Engineering fundamentals to solve complex Automobile Engineering problems.
- Identify, formulate& analyze Automobile Engineering problems in order to reach substantial conclusion using laws of engineering science.
- Able to investigate complex automobile problems and find appropriate solution leading to valid conclusion.
- Design automobile system, components, process to meet specified needs with appropriate attention to health, safety, standards, economy, environmental, social considerations.
- Create, select, apply appropriate techniques resources and advanced engineering and software tools necessary to analyze and design automobile engineering problems.
- Understand the impact of automobile engineering solution on society and environment for sustainable development.
- Understand society, health, safety, legal and cultural issues and responsibilities relevant to engineering profession.
- Apply professional ethics, accountability and equity in engineering profession.
- Able to work in multidisciplinary team and leader for common goals.
- Communicate effectively within profession and society at large.
- Able to appropriate incorporate principles of management and finance in one's own work.
- Identify educational needs and engage in life long learning in a changing world of technology.

Program specific outcomes

- Identify, Understand, Formulate, and analyze complex engineering problems in Automobile, design, thermal and manufacturing.
- Plan and execute efficient, sustainable, safe and cost-effective manufacturing of automobile components in ICE, AS, CBE through CAD/CAM/CAE tools ethically.

Information Technology

Program outcomes

At the end of the program, a student will be able to:

- Apply the knowledge of Mathematics, Science, Engineering fundamentals to solve complex Information Technology Engineering Problems.
- Identify, formulate and analyze Information Technology Engineering problems to derive conclusion using first principles of mathematics and Computer Science.
- Investigate complex Information Technology engineering problems and find appropriate solution leading to valid conclusion.
- Design IT systems, components or processes to meet specified needs with appropriate attention to health, safety, standards, environmental and societal consideration.
- To create select & apply appropriate techniques, resources advance engineering & software tools necessary to analyze & design Information Technology Problems.
- Understand the impact of IT Solutions on society and environment for sustainable development.
- Understand social, safety, culture and legal issues and responsibilities relevant to engineering profession.
- Apply professional ethics, accountability and equity in engineering profession.
- Work effectively as a member and leader in multidisciplinary team for a common goal.
- Communicate effectively within a profession and with society at large.
- Appropriately incorporate principles of Management & Finance to one's own work.
- To identity Educational needs & engage in lifelong learning in a changing word of technology.

Program specific outcomes

1. Identify, understand, formulate and analyze complex engineering problems in the field of Network system, Database management, Web communication, Computer programming and software development.

2. Plan, design, develop and manage software in the field of artificial intelligence , data mining, network management and security, cloud based services and Internet of Things applications through use of secure, reliable and cost effective state of art IT tools efficiently

Information Technology Department

Class: BE-Odd sem 2018-2019

Subject code: **IT**	Subject Name**: Cloud Computing.**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Explain fundamentals and essentials of cloud computing.
2	Implement virtualization tools.
3	Differentiate cloud computing services and deployment models.
4	Design and develop applications by using cloud computing services.
5	Establish cloud computing environments by using open source tools.
6	Classify various security threats in cloud computing environment.

Subject code: **ITC703**	Subject Name **: Intelligent Systems**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Develop a basic understanding of the building blocks of AI as presented in terms of intelligent agents.
2	Choose an appropriate problem-solving method.
3	Analyze and formalize the problem (as a state space, graph, etc.) and select the appropriate search method.
4	Develop/demonstrate/ build simple intelligent systems
5	Choose an appropriate knowledge-representation scheme.
6	Classical toy problems using different AI techniques.

Subject code: **ITDLO5012**	Subject Name**: Image Processing.**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Describe fundamental concepts of a digital image processing system.
2	Represent images in spatial domain.
3	Evaluate the techniques for image enhancement, image restoration and histogram equalization.
4	Analyze images in frequency domain using various transforms and segmentations.
5	Categorize various compression techniques.
6	Compute image morphological operations, representation techniques and applications of image processing.

Subject code**: ITC7053**	Subject Name: **E-commerce and e-business**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Understand the basic concepts of ecommerce and its choose suitable type.
2	Describe hardware and software technologies for ecommerce
3	Understand importance of payment system and choose suitable payment system
4	Plan e marketing strategies
5	Select E-business model
6	Aware about several factors while developing E-business website

Subject code: **ITC701**	Subject Name: **Software Project Management**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Illustrate the use of project life cycle by distinguishing it with SDLC.
2	Articulate similarities and differences between IT Projects and other type of projects.
3	Develop key areas such as project charter, Work Breakdown Structure, MOV for IT Projects.
4	Estimate the resources (Time, Cost, Human being etc).
5	Ensure the quality of project using various standards.
6	Identify IT project risk and develop the risk mitigation strategies.

Subject code: **ITC702**	Subject Name: **Wireless Technology.**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Understand the basic concepts such as frequency spectrum, modulation, and multiple radio access technology involved in wireless communication.
2	Apply cell based network architecture and frequency reuse concepts to solve cellular network design problem.
3	Explain role of WLL Wirless in local loop in providing broadband services.
4	Describe and judge the emerging wireless technologies standards such as WLAN,WPAN,WMAN
5	Demonstrate security mechanism to avoid attacks in wireless network.
6	Express factors of change in economics of wireless technology.

Even Semester

Class: SE

Subject code: **ITC402**	Subject Name **: Computer Networks**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Illustrate the functions of each layer in OSI and TCP/IP model.
2	Express the functions of Application Layer and Presentation layer paradigms and Protocols.
3	Describe the session layer design issues and Transport layer services.
4	Classify the routing protocols and analyze how to assign the IP addresses for the given network.
5	Describe the functions of the data link layer and the protocols.
6	Explain and Classify the types of transmission media with real time application.

Subject code:**ITC403**	Subject Name **Operating System**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Describe the important computer system resources and the role of operating system in their management policies and algorithms.
2	Illustrate the process management policies and scheduling of processes by CPU.
3	Paraphrase the requirement for process synchronization and coordination handled by Operating system.
4	Associate and analyze the memory management and its allocation policies.
5	Identify use and evaluate the storage management policies with respect to different Storage management technologies.
6	Show the need to create the special purpose operating system.

Subject code: **IT C404**	Subject Name **: Computer Organization and Architecture**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Describe basic organization of computer and the architecture of 8086 microprocessor.
2	Implement assembly language program for given task for 8086 microprocessor.
3	Demonstrate control unit operations and conceptualize instruction level parallelism.
4	Express and perform computer arithmetic operations on integer and real numbers.
5	Categorize memory organization and explain the function of each element of a memory hierarchy.
6	Identify and compare different methods for computer I/O mechanisms

Subject code: **ITC405**	Subject Name: **Automata Theory**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Analyze, Understand, design, construct and interpret Regular languages, Expression and Grammars.
2	Design different types of Finite Automata and Machines as Acceptor, Verifier and Translator.
3	Interpret, Understand, design, and analyze Context Free languages, Expression and Grammars.
4	Construct different types of Push down Automata as Simple Parser.
5	Design different types of Turing Machines as Acceptor, Verifier, Translator and Basic computing machine.
6	Compare, understand and analyze different languages, grammars, Automata and Machines and appreciate their power and convert Automata to Programs and Functions

Class: TE-even sem

Subject code: **ITC601**	Subject Name **: Software Engineering with Project Management**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Define various software application domains and remember different process model used in software development.
2	Explain needs for software specifications also they can classify different types of software requirements and their gathering techniques.
3	Convert the requirements model into the design model and demonstrate use of software and user-interface design principles.
4	Distinguish among SCM and SQA and can classify different testing strategies and tactics and compare them.
5	Justify role of SDLC in Software Project Development and they can evaluate importance of Software Engineering in PLC.
6	Generate project schedule and can construct, design and develop network diagram for different type of Projects. They can also organize different activities of project as per Risk impact factor.

Subject code: **ITC602**	Subject Name**: Data Mining and Business Intelligence**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Analyze and understand of the importance of data mining and the principles of BI.
2	Organize and prepare the data needed for data mining using preprocessing techniques.
3	Perform exploratory analysis of data to be used for mining.
4	Implement the appropriate data mining method like classification, clustering or frequent mining on large data sets.
5	Define and apply metrics to measure the performance of various data mining algorithms.
6	Apply BI to solve practical problems: analyze the problem domain, use the data collected from enterprise apply the appropriate data mining technique, interpret and visualize the results, provide decision support.

Subject code: **ITC603**	Subject Name **: Cloud Computing and services**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Explain fundamentals and essentials of cloud computing.
2	Implement virtualization tools.
3	Differentiate cloud computing services and deployment models.
4	Design and develop applications by using cloud computing services.
5	Establish cloud computing environments by using open source tools.
6	Classify various security threats in cloud computing environment.

Subject code: **ITC604**	Subject Name **Wireless Networks**	Credits:04

1	Explain the basic concepts of wireless network and wireless generation .
2	Analyze the different wireless technologies such as CDMA, GSM,GPRs etc.
3	Appraise the importance of Adhoc networks such as MANET, VANET and wireless sensor networks.
4	Describe and judge the emerging wireless technologies standards such as WLL,WPAN,WMAN.
5	Use design considerations knowledge for deploying the wireless network infrastructure
6	Differentiate and support the security measures, standards, services and layer wise security consideration.

Subject code: **ITDLO6023**	Subject Name **: Digital Forensics**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Illustrate the concept of ethical hacking and its associated applications in Information Communication Technology (ICT) world.
2	Assess the need of digital forensic and role of digital evidences.
3	Explain the methodology of incident response and various security issues in ICT world, and identify digital forensic tools for data collection .
4	Recognize the importance of digital forensic duplication and various tools for analysis to achieve adequate perspectives of digital forensic investigation in various applications /devices like Windows/Unix system
5	Apply the knowledge of IDS to secure network and performing router and network analysis
6	Propose the method to generate legal evidence and supporting investigation reports and will also be able to use various digital forensic tools .

Class: BE

Subject code: **ITC801**	Subject Name**: Computer Simulation And Modeling**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1.	Recognize simulation and its real life application and its importance in business, science, engineering, industries and services and able to solve simulation problems manually.
2.	Analyze events and inter arrival time, arrival process, queuing strategies, resources and disposal of entities.
3.	Difference between random number and random variety, as well as they will be able to apply and test the hypotheses by solving the problems.
4.	Differentiate validation and verification of system. Also able to check different output against different input of system to check the performance of system.
5.	Estimate and validate a model based upon input and output data
6.	Select natural, physical and engineering sciences, mathematics, statistics, computer and information sciences to engineering applications.

Subject code: **ITC802**	Subject Name**: Big Data Analytics**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Recognize the key issues in big data management and its associated applications in intelligent business and scientific computing.
2	Acquire fundamental enabling techniques and scalable algorithms like Hadoop and Map Reduce in big data analytics.
3	Develop NOSQL databases using different tools.
4	Interpret business models and scientific computing paradigm, and apply software tools for big data analytics.
5	Achieve adequate perspectives of big data analytics in various applications like clustering, social media applications etc.
6	Propose a recommendation system using different algorithms.

Subject code:**ITC803**	Subject Name**: Storage Network Management and Retrival.**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Understand current RAID levels technologies with common applications
2	Evaluate storage architectures, including storage subsystems, SAN, NAS.
3	Examine emerging technologies including IP-SAN
4	Identify different storage virtualization technologies.
5	Articulate business continuity solutions backup and recovery techniques.
6	Define and explain information retrieval in storage network

Subject code:**ITC8046**	Subject Name: **Software Testing and Quality Assurance**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Identify the reasons for bugs and analyze the principles in software testing to prevent and remove bugs.
2	Provides practical knowledge of a variety of ways to test software and an understanding of some of the trade-offs between testing techniques.
3	Apply the software testing methods in commercial environments.
4	Test adequacy assessment using: control flow, data flow, and program mutations.
5	Methods of test case generation from requirements.
6	Implement various test processes for quality improvement.

Computer Engineering

Odd Semester

Name of the Subject: -Digital Logic Design and Analysis Code no. of Subject: - CSC 302
Class/Sem: - SE Sem III

Course Outcomes (CO's)

After successfully completing the course students will have the ability to:

1	Understand the different number system and their conversions
2	Formulate analyse and minimize Boolean expressions.
3	Design and analyse combinational logic circuits
4	Design and analyse sequential circuits
5	Understand the basic concepts of VHDL
6	Understand the basics of TTL and CMOS logic families

Name of the Subject: - Discrete Mathematics Code no. of Subject: - CSC303

Course Outcomes (CO's)

After successfully completing the course students will have the ability to:

1	Apply the knowledge of Discrete Mathematics to solve complex engineering problem.
2	Identify, select and apply clear thinking for problem solving using laws of logic and mathematical induction.
3	Investigate complex relations and functions to find appropriate solution leading to a valid conclusion.
4	Identify formulate and analyze permutation and combination using principle of mathematics.
5	Apply the background knowledge of Discrete Mathematics to identify type of graph.
6	Apply the knowledge of mathematics to solve algebraic structure and detecting and correcting code in the transmitted data.

Name of the Subject: -Data Structure Code no. of Subject: -CSC305

Course Outcomes (CO's):

After successfully completing the course students will have the ability to:

1	Understand, identify and Describe various linear and non-linear data structure.
2	Create , select and write different searching ,insertion , deletion, traversing mechanism on s and queue.
3	Investigate and create efficient storage mechanisms of data for given problem like linked list to find appropriate solution.
4	Understand and apply different tree techniques to solve the complex computer engineering problems.
5	Identify and apply concepts of graph in various domain like DBMS , compiler Construction
6	Apply different sorting and searching techniques. Design and develop project in groups.

Name of the Subject: -Microprocessor Code no. of Subject: -CSC501

Course Outcomes:

On successful completion of course, students will be able to

1	Understand, Identify and Describe various processor function to cope with changing world o Technology.
2	Write software for 8086 programs.
3	Understand and apply concepts of interrupts with 8086 processor and interrupt controller.
4	Investigate Engineering problems and design embedded system to solve real time problems.
5	Identify and analyze the problems and importance of higher end processors.
6	Investigate complex problems with background knowledge and find the use and importance of multicore processor

Name of the Subject: - Database Management System Code no. of Subject: - CSC502

Course Outcomes (CO's)

After successfully completing the course students will have the ability to:

1	Identify and analyze the roles and responsibilities of different types of user and investigate the different architecture to find appropriate solution.
2	Design data modeling using ER and Extended ER features to meet the specified needs.
3	Investigate and apply different relational algebra operators to find appropriate solution leading to valid conclusion.
4	Investigate and formulate SQL queries to find appropriate solution to complex Problems.
5	Identify and apply different normalization techniques to process and meet the specified needs with appropriate solution to safety standards and societal consideration.
6	Design a software system effectively as a member and leader in a team for a common goal of database processing and controlling consequences of concurrent data access

Name of the Subject: - Computer Networks Code no. of Subject: - CSC503

Course Outcomes (CO's)

After successfully completing the course students will have the ability to:

1	Understand the fundamentals of data communication. Apply this knowledge to analyze different types of media used at physical layer. Identify the differences between ISO - OSI model with TCP/IP model.
2	Apply the knowledge of different protocols used at data link layer to investigate appropriate protocol for system. Also analyze the differences in protocols.
3	Select and apply appropriate concepts of subnetting / supernetting of IP addressing. Design the network according to specified needs.
4	Analyze various routing algorithms and protocols at network layer. Understand the impact of protocol on system.
5	Investigate congestion and apply appropriate congestion control algorithm. Also classify and compare transport layer protocols.
6	Identify the protocols used at application layer. Students will be able to analyze the protocols in terms of organization need, its impact.

Name of the Subject: -TCS Code no. of Subject: - CSC504

Course Outcomes:

On successful completion of course learner will be able to:

1	Identify the central concepts in theory of computation and analyse differentiate between deterministic and nondeterministic automata, apply formulate knowledge to obtain equivalence of NFA and DFA.
2	Investigate the equivalence of languages described by finite automata and regular expressions.
3	Create and apply regular, context free grammars while recognizing the strings and tokens.
4	Design pushdown automata model to recognize the language.
5	Develop an understanding of computation through Turing Machine.
6	Acquire fundamental understanding of decidability and un decidability and apply the knowledge to solve computer engineering problem.

Name of the Subject: -Adv.AOA

Course Outcomes:

At the end of course, students will attain an ability to:

1	Describe and apply the analysis techniques for algorithms.
2	Identify and analyze the appropriate data structure and design techniques for different problems.
3	Illustrate and select the appropriate algorithm to be applied for the various application like geometric modeling, robotics, networking, etc.
4	Appreciate and Describe the role of probability and randomization in the analysis of algorithm.
5	Analyze and apply probability and randomization in various algorithms.
6	Differentiate and analyze polynomial and non deterministic polynomial algorithms.

Name of the Subject: -Multimedia System Code no. of Subject: - CSDLO5011 302

Course Outcomes (CO's)

After successfully completing the course students will have the ability to:

1	Understand basics of multimedia and multimedia system architecture and apply the knowledge in engineering profession.
2	Understand the impact of multimedia components on society and environment for sustainable development.
3	Understand file formats for different multimedia components
4	Identify, formulate and analyse different compression techniques and apply them solve complex compute engineering problems.
5	Apply the knowledge of multimedia communication techniques to improve the quality of service.
6	Identify, formulate and analyse different security techniques and apply these techniques of information security in multimedia environments.

Name of the Subject: -Web Design Lab Code no. of Subject: - CSL504

Course Outcomes (CO's)

After successfully completing the course students will have the ability to:

1	Understand the core concepts and features of Web Technology and setting up the lamp/xamp/wamp server
2	Develop static web pages using HTML5 and CSS3
3	Understand and apply the concept of client side validation and design dynamic web pages using JavaScript and JQuery.
4	Design Interactive web pages using PHP , AJAX with database connectivity using MySQL and evaluate client and server side technologies
5	Understand the basics of XML, DTD and XSL and develop web pages using XML / XSLT
6	Identify and analyze end user requirements and develop web application using appropriate web technologies and web development framework

Odd Semester

Name of the Subject: - Mobile Communication and Computing Code no. of Subject: - CSC702
Class/Sem: - B.E./VII

Course Outcomes (CO's)

After successfully completing the course students will have the ability to:

1	Identify fundamentals or basic concepts and principles in mobile communication & computing, cellular architecture. Analyze the techniques available and understand the impact.
2	Understand all generation of mobile computing i.e. GSM, GPRS, UMTS, UTRAN. Apply the knowledge to analyze its performance, its impact on society, environment for sustainable development.
3	Apply appropriate techniques for communication or routing in mobile computing. Understand fundamentals or different concepts related to it. Investigate problems in communication, discuss its solutions.
4	Identify the difference between WLAN, HIPERLAN1, HIPERLAN2 (802.11a, 802.11b etc.). Analyze it in terms of protocols, bandwidth used etc.
5	Understand the impact of mobility on communication. Select and apply appropriate techniques for mobility management. Design a system to show handover management.
6	Apply the knowledge to understand Long Term Evolution (LTE) architecture, its

Name of the Subject: -MIS Code no. of Subject: - ILO 7013

Course Outcomes (CO's)

After successfully completing the course students will have the ability to:

1	Apply and analyse the blend of management technical filed for how information systems Transform Business
2	Understand the principal tools and technologies for accessing information from databases to improve business performance and decision making
3	Understand the roles played by information technology in today's business and define various technology architectures on which information systems are built
4	Identify and understand the impact information systems have on an organization and environment for sustainable development
5	Understand IT infrastructure and its components and its current trends of societal, legal issues safety and responsibility of relevant to engineering profession
6	Identify the types of systems used for enterprise-wide knowledge management and how they provide value for businesses

Name of the Subject: -CSL Code no. of Subject: - ILO 7013

Course Outcomes (CO's)

After successfully completing the course students will have the ability to:

I.	Understand and Identify different cybercrimes and its impact on society.
II.	Understand various planned attacks and Identify, select and apply security challenges in electronic device.
III.	Identify appropriate technique to analyse different tools and methods used in cybercrime.
IV.	Communicate effectively regarding different aspects of cyberlaw and understand the impact on society.
V.	Investigate Problems and apply IT law in various legal issues to find appropriate solutions.
VI.	Understand and apply Information security standard compliance during software design and development.

Name of the Subject: -Big Data Analytics Code no. of Subject: - ILO 7013

Course Outcomes:

At the end of course, students be able to :

1	Understand and analyze the basic concepts of Big Data.
2	Identify , analyze and compare various map reduce algorithms and apply them to find appropriate solution leading to a valid conclusion.
3	Create and apply various NOSQL commands on Key value stores for Computer Engineering Problems.
4	Identify, formulate and analyze various data mining algorithms and apply them to find appropriate solution.
5	Create, Select and apply appropriate algorithms to form various clusters from a given set of data.
6	Identify and apply various page rank algorithms and apply algorithms to cluster social network graphs.

Even Semester

Name of the Subject: -Analysis of algorithm Code no. of Subject: - CSC402

Course Outcomes:

At the end of course, student should be able to:

1	Illustrate and analyze the running time and space complexity of algorithms.
2	Describe, apply and analyze the complexity of divide and conquer strategy.
3	Identify, apply and analyze the complexity of greedy strategy.
4	Determine, apply and analyze the complexity of dynamic programming strategy.
5	Explain, design and apply backtracking, branch and bound and string matching techniques to deal with some hard problems.
6	Categorize the classes P, NP, and NP-Complete and be able to prove that a certain Problem is NP-Complete.

Name of the Subject: - Computer Organization and Architecture Code no. of Subject: - CSC403

Course Outcomes (CO's)

After successfully completing the course students will have the ability to:

1	Apply the knowledge of mathematical science and engineering fundamentals to solve arithmetic operations and understand processing in ALU
2	Analyze the instruction level parallelism and identify and investigate the hazards in typical processor pipeline
3	Understand and apply the hardwired and microprogrammed control unit design to meet the specified needs
4	Understand the different types of memory and apply the appropriate memory mapping technique
5	Apply the knowledge to analyze different I/O devices and I/O interfaces
6	Understand and identify different types of buses and investigate different type of parallel processing architecture

Name of the Subject: -Computer Networks Code no. of Subject: - CSC503

Course Outcomes (CO's)

After successfully completing the course students will have the ability to:

1	Understand the fundamentals of data communication. Apply this knowledge to analyze different types of media used at physical layer. Identify the differences between ISO - OSI model with TCP/IP model.
2	Apply the knowledge of different protocols used at data link layer to investigate appropriate protocol for system. Also analyze the differences in protocols.
3	Select and apply appropriate concepts of subnetting / supernetting of IP addressing. Design the network according to specified needs.
4	Analyze various routing algorithms and protocols at network layer. Understand the impact of protocol on system.
5	Investigate congestion and apply appropriate congestion control algorithm. Also classify and compare transport layer protocols.
6	Identify the protocols used at application layer. Students will be able to analyze the protocols in terms of organization need, its impact.

Name of the Subject: -System Programming and compiler construction Code no. of Subject: - CSC503

Course Outcomes:

At the end of course, students will attain an ability to:

1	Identify and understand the relevance of different system programs.
2	Describe and create the various data structures and passes of assembler design.
3	Identify and analyze the need for different features and designing of macros.
4	Distinguish different loaders and linkers and their contribution in developing efficient user applications.
5	Construct different parsers for given context free grammars.
6	Justify the need synthesis phase to produce object code optimized in terms of high execution speed and less memory usage

Name of the Subject: -Data warehousing and mining Code no. of Subject: -CSC605

Course Outcomes (CO's)

After successfully completing the course students will have the ability to:

1	Understand, identify and apply essentiality of data warehouse.
2	Apply the ETL process and analyze different OLAP Operation and Models .
3	Select and apply appropriate data mining technique .
4	Understand and apply different task in data mining to solve the complex computer engineering problems.
5	Identify and apply concepts of of association rule for real time application
6	Understand and apply the concept of spatial and web mining.

Name of the Subject: -Machine Learning Code no. of Subject: - CSDL0621

Course Outcomes:

On successful completion of course, students will be able to

1	Apply and Understand the basic concepts of ML
2	Identify and analyze different learning rule
3	Identify and apply different optimization technique to solve problem.
4	Identify, formulate and analyze problems to solve using ML learning techniques
5	Apply Dimensionality Reduction techniques.
6	Design and Develop application using ML techniques

Name of the Subject: -Human Machine Interaction Code no. of Subject: - CSC801

Course Outcomes (CO's)

After successfully completing the course students will have the ability to:

1	Apply and understand the fundamental of Human Machine Interaction to solve complex problems
2	Analyze and understand the human psychology to communicate effectively in society by using HMI
3	Understand the Impact of Computer Engineering solution on society and motivate the students for research in machine interface design
4	Investigate different design technologies to meet user requirement and valid conclusion
5	Identify and apply appropriate technique for mobile interaction design and its usage in society
6	Design and develop application for social and technical task

Name of the Subject: - Distributed Computing Code no. of Subject: - CSC802

Course Outcomes (CO's)

After successfully completing the course students will have the ability to:

1	Apply and demonstrate knowledge of the basic elements and concepts related to distributed system technologies.
2	Investigate and illustrate the middleware technologies that support distributed applications such as RPC, RMI and Object based middleware.
3	Analyze the various techniques used for clock synchronization and mutual exclusion.
4	Elaborate the concepts of Resource and Process management and synchronization algorithms.
5	Understand and explain the use of Consistency and Replication Management.
6	Apply the knowledge of Distributed File System to analyze various file systems like NFS, AFS and the experience in building large-scale distributed applications.

Name of the Subject: -NLP Code no. of Subject: -DLO8012

Course Outcomes (CO's)

After successfully completing the course students will have the ability to:

1	Understand, identify and Describe Processing of natural language to cope with change in A world of technology.
2	Create and apply appropriate techniques for word level analysis in natural language processing.
g 3	Design and apply the concept of main language level: Morphology, syntax, semantic, pra For a software system to meet specified needs with social consideration.
4	To investigate engineering problem and design model for semantic analysis.
5	Identify difficult issues of society and to create the various language models in world of N
6	Design and develop Miniproject in groups.

Name of the Subject: -Project /Miniproject

Course Outcomes (CO's)

After successfully completing the course students will have the ability to:

1	Understand societal, health and legal issues and apply practical knowledge within the chosen area of technology for project development.
2	Identify, analyze and formulate problem within programming projects in a comprehensive and systematic approach .
3	Design and develop Engineering solutions to complex problem utilizing a systematic approach
4	Work effectively as an individual or in a team in development of technical projects.
5	Communicate effectively with profession by presenting project related activities
6	Demonstrate knowledge, skills and attitude of a professional engineers and community at large

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Automobile Engineering

Even Semester

Class: SE

Subject code: **AEC301**	Subject: **Applied Mathematics-III**	Credits:4

Course Outcomes:

At the end of course, students will attain an ability to:

1	Understand problems in Engineering domain related to Statistics.
2	Analyze & Solve Engineering Problems Using Laplace Transform.
3	Evaluate Engineering Problems Using Fourier Series.
4	Classify Engineering Problems Using Complex Variable & Integration
5	Compare problems Related to Statistics Using Various Methods
6	Illustrate Engineering Problems Using Complex Variable.

Subject code: **AEL301**	Subject: **Computer Aided Machine Drawing**	Credits:4

Course Outcomes:

At the end of course, students will attain an ability to:

1	Apply Knowledge of Mathematics, Science & Engineering.
2	Design & Conduct Experiments, as well as to analyze & interpret Data.
3	Create Solid Models of Different Machine Parts.
4	Assemble the Machine parts to Create a Complete Machine.
5	Disassemble the Machine Parts from a Complete Machine.
6	Sketch the Different Views of Intersection of two Solids

Subject code: **AEC305**	Subject: **Material Technology**	Credits:4

Course Outcomes:

At the end of course, students will attain an ability to:

1	Describe various Materials.
2	Explain various failure of Mechanism
3	Apply different types Theory of Alloys& Alloys Diagrams.
4	Determine basic engineering materials, their structure-property-performance
5	Discriminate the strengthening processes including heat treatment processes in order to enhance properties
6	Propose new materials and their applications

Subject code: **AEC304**	Subject: **Production Process-I**	Credits:4

Course Outcomes:

At the end of course, students will attain an ability to:

1	Demonstrate understanding of casting process.
2	Illustrate principles of forming processes
3	Demonstrate applications of various types of welding processes.
4	Differentiate chip forming processes such as turning, milling, drilling, etc..
5	Illustrate the concept of producing polymer components and ceramic components.
6	Distinguish between the conventional and modern machine tools

Subject code: **AEC303**	Subject: **Strength of Material**	Credits:4

Course Outcomes:

At the end of course, students will attain an ability to:

1	Demonstrate fundamental knowledge about various types of loading and stresses induced
2	Draw the SFD and BMD for different types of loads and support conditions.
3	Analyze the stresses induced in basic mechanical components.
4	Estimate the strain energy in mechanical elements.
5	Analyze the deflection in beams.
6	Analyze buckling and bending phenomenon in columns, struts and beams.

Subject code: **AEC504**	Subject: **Automotive Systems**	Credits:4

Course Outcomes:

At the end of course, students will attain an ability to:

1	Indicate different automotive systems and subsystems
2	Examine different automotive components.
3	Point out working and functions of various automotive components
4	Examine working and function of electric drive lines.
5	Interrelate working of Special vehicles through case study.
6	Infer and Demonstrate different vehicle layouts

Subject code: **AEC503**	Subject: **Heat Transfer**	Credits:4

Course Outcomes:

At the end of course, students will attain an ability to:

1	Describe different modes of heat transfer
2	Classify/ Illustrate different modes of heat transfer.
3	Use/Apply steady state approach to solve conduction problems.
4	Identify and use transient methods to solve time varying problem
5	Analyze boiling and condensation processes
6	Propose the radiation analysis techniques on simple models

Subject code: **AEC501**	Subjet: **Internal Combustion Engine**	Credits:4

Course Outcomes:

At the end of course, students will attain an ability to:

1	Classify SI and CI Engines and different cycles
2	Identify and Explain working of Engine Components, Ignition System in SI Engine
3	Identify and Explain working of Engine Components, Fuel Injection System in CI Engine
4	Demonstrate engine lubrication and cooling system
5	Summarize Engine performance charateristics
6	Conclude Modern trends in IC Engine

Subject code: **AEC502**	Subject: **Mechanical Measurement and control**	Credits:4

Course Outcomes:

At the end of course, students will attain an ability to:

1	Classify various types of static characteristics and types of errors occurring in the system
2	Classify and select proper measuring instrument for linear and angular displacement.
3	Classify and select proper measuring instrument for pressure and temperature measurement
4	Design mathematical model of system/process for standard input responses.
5	Analyze error and differentiate various types of control systems and time domain specifications
6	Analyze the problems associated with stability.

Subject code: **AEDLO5011**	Subject: **Press Tool Design**	Credits:4

Course Outcomes:

At the end of course, students will attain an ability to:

1	Demonstrate various press working operations for mass production of sheet metal parts
2	Identify press tool requirements to build concepts pertaining to design of press tools
3	Prepare working drawings and setup for economic production of sheet metal components
4	Select suitable materials for different elements of press tools
5	Illustrate the principles and blank development in bent & drawn components.
6	Revise failure mechanisms of pressed components, safety aspects and automation in press working

Class BE

Subject code: **AEC703**	Subject: **Automotive Design.**	Credits:4

Course Outcomes:

At the end of course, students will attain an ability to:

1	Design of various parts of I.C. Engines
2	Design ofCrank, crankshaft and crank pin
3	Design of Clutches and Gear Boxes
4	Design of Drive train
5	Judge the fundamental knowledge in the field of automotive design
6	Determine the analytical abilities to give solutions to Automotive design problems

Subject code: **AEC702**	Subject: **CAD/CAM/CAE**	Credits:4

Course Outcomes:

At the end of course, students will attain an ability to:

1	Identify proper computer graphics techniques for geometric modeling.
2	Transform, manipulate objects and store and manage data.
3	Prepare part programming applicable to CNC machines.
4	Use rapid prototyping and tooling concepts in any real life applications.

5	Identify the tools for Analysis of a complex engineering component.
6	Generate CAM Tool path Creation and NC- G code output.

Subject code: **AEC704**	Subject: **Product Design and Development**	Credits:4

Course Outcomes:

At the end of course, students will attain an ability to:

1	Demonstrate product design and development process
2	Illustrate considerations of Design for Manufacturing and Assembly in product development.
3	Analyze a product in perspective of aesthetic and ergonomic considerations.
4	Illustrate concepts of QFD aspects in product development.
5	Demonstrate applicability of value engineering in product optimization
6	Demonstrate legal and social issues pertaining to product development.

Subject code: **AEE 7017**	Subject: **Transportation Management &Motor Industries**	Credits:4

Course Outcomes:

At the end of course, students will attain an ability to:

1	Recognize various Motor Vehicle Act
2	Explain various Taxation act.
3	Use different types of motor insurance
4	Determine Passenger Transport Operation
5	Detect the basic concepts of transport management
6	Design Advance Techniques in Traffic Management

Subject code: **AEE 7011**	Subject: **Power Plant Engineering**	Credits:4

Course Outcomes:

At the end of course, students will attain an ability to:

1	Comprehend various equipment's and systems utilized in power plants
2	Illustrate power plant economics
3	Select the site for power plant by comparing various types of power plant.
4	Discuss types of reactors, waste disposal issues in nuclear power plants
5	Demonstrate the working of PWR, BWR, and CANDU reactors.
6	Plot the load curve and performance & operating characteristics of power plant.

Subject code: **AEC302**	Subject: **Thermodynamics**	Credits:4

Course Outcomes:

At the end of course, students will attain an ability to:

1	Demonstrate application of the laws of thermodynamics to wide range of systems.
2	Write steady flow energy equation for various flow and non-flow thermodynamic systems.
3	Compute heat and work interactions in thermodynamic systems.
4	Demonstrate the interrelations between thermodynamic functions to solve practical problems.
5	Use of steam table and mollier chart to compute thermodynamic interactions.
6	Compute efficiencies of heat engines, power cycles, etc.

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Electronics and Telecommunication Engineering

Class SE-odd sem

Subject code: **ETC304**	Subject Name **:Circuit Theory & Networks**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Apply their knowledge in analyzing Circuits by using network theorems.
2	Analyze magnetic circuits.
3	Apply/Use the time and frequency method analysis to circuits
4	Compute network topology & network functions for one port and two port networks.

5	Find the various parameters of two port networks inter relationship among various circuit parameters, solve more complex network using these parameters
6	Synthesize the network using passive elements

Subject code:**ETC302**	Subject Name **:Electronics Devices and circuits-I**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Apply the current voltage characteristics of semiconductor devices, analyze dc circuits and relate ac models of semiconductor devices.
2	Apply the concepts for the design of Regulators and Amplifiers.
3	Classify transistor biasing techniques and designing.
4	Analyze transistor modelling and small signal analysis of amplifier.
5	Evaluate frequency response to understand behaviour of Electronics circuits.
6	Design small signal amplifiers.

Subject code:**ETC304**	Subject **:Electronic Instrumentation and control**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Develop the basics of instruments and their application.
2	Illustrate principle of operation for various sensors.
3	Produce functional blocks of data acquisition system.
4	Compute transfer functions for given system.
5	Compose time domain and frequency domain parameter for Given system.
6	Construct stability of given system using appropriate criteria.

Class TE

Subject code:**ECL503**	Subject Name**: Business Communication & Ethics**	Credits:04

Course Outcomes:

At the end of course, students will attain anability to:

1	Illustrate a technical document using precise language, suitable vocabulary and appropriate style.
2	Demonstrate knowledge of professional and ethical responsibilities by effective communication in both verbal and written form
3	Develop the life skills with key expertise to progress professionally by building stronger relationships.
4	Sketch an entrepreneurial approach and ability for life-long learning. Demonstrate awareness of contemporary issues.

5	Apply the traits of a suitable candidate for pursuing higher education/ job interview, upon being trained in the techniques of presentation and Interview skills.
6	Deliver formal presentations, effectively implementing the verbal and non-verbal skills. Participate and succeed in Campus placements and competitive examinations

Subject code:**ECC503**	Subject Name: **Electromagnetic Engineering.**	Credits: 04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Evaluate electromagnetic fields in planar, cylindrical and spherical geometries.
2	Solve electrostatic and magnetostatic problems in electronic systems.
3	Describe knowledge of time varying fields in wave propagation through different media.
4	Interpret Maxwell's equations physically and apply this knowledge to determine wave
5	Solve transmission line problems analytically as well as graphically.
6	Explain knowledge of static and time varying electromagnetic field theory in various applications.

Subject code:ECC502	Subject Name**: Digital Communication**	Credits: 04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Identify signals and functions of its components.
2	Construct codewords by applying Shannon Fano and Huffman coding algorithm.
3	Estimate information, average information(entropy) etc.
4	Design channel encoder.
5	Detect and correct error for optimum receiver mathematically.
6	Propose classification techniques in machine vision to classify objects.

Subject code**:ECC504**	Subject Name**: Discrete Time Signal Processing**	Credits: 04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Apply the concept of DFT and FFT.
2.	Design digital IIR filter with arbitrary specification.
3.	Assess the knowledge of design of digital FIR filter with arbitrary specification.
4.	Generalize the effect of hardware limitation on performance of digital filter.
5.	Illustrate finite word length effect of digital filters.
6.	Implement DSP Processor for real time application.

Class BE

Subject code : ETE701	Subject Name**: :Data compression & Encryption**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Compare lossy and lossless compression techniques
2	Compute Text compression on video,text and image techniques
3	Evaluate Image compression and Video compression techniques
4	Classify Different encryption techniques
5	Basics of Data security and cryptography
6	Apply the basic techniques in various system security fields

Subject code:ECC702	Subject Name**: Mobile Communication**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Generalize GSM network architecture, speech coding, identifiers, services and system capacity.
2	Explain CDMA architecture, forward and reverse channels.
3	Differentiate 2G,2.5G and 2.75G mobile evolution.
4	Differentiate 4G emerging technology like SDR, MIMO etc.
5	Infer Small scale and large scale propagation.
6	Analyze indoor and outdoor Propagation models related to fading.

Subject code:ETC704	Subject **: Microwave and RADAR Engineering.**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Recognize the importance of microwave engineering.
2	Interrelate / Express the concept of waveguide transmission.
3	Demonstrate microwave designing using smith chart.
4	Inculcate construction and working of different microwave devices.
5	Demonstrate the concept of microwave signal generation and amplification.
6	Illustrate the characteristics and application of different semiconductor microwave devices.
7	Conclude the working principle of RADAR and its types.
8	Justify the different applications of RADAR and microwave engineering.

Subject code:**ETC703**	Subject : **Optical Communication and Networks**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Develop confidence for self education and ability for lifelong learning continue to be motivated to learn new concepts Become well conversant with waveguide transmission.
2	Apply the fundamental principles of optics and light wave to design optical fiber communication systems.
3	Identify structures, functions, materials, and working principle of optical fibers, light sources, couplers, detectors, and multiplexers
4	Design optical fiber communication links using appropriate optical fibers, light sources, couplers, detectors, and multiplexers.
5	Explore concepts of designing and operating principles of modern optical communication systems and networks.
6	Demonstrate the ability to design a system, component or process as per needs and specification

Class SE-Even Sem'

Subject code:**ECC402**	Subject Name **:Electronics Devices and circuits-II**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Study the operation of bias circuit of MOSFET.
2	Use Design and analyze the operation of MOSFET.
3	Identify and use the multistage amplifier using BJT and FET in various configuration to determine frequency response and concept of voltage gain.
4	Illustrate different power amplifier circuits, their design and use in electronics and communication circuits.
5	Know about the concept of negative feedback amplifier and their characteristics.
6	Design the different oscillator circuits for various frequencies.

Subject code:ECC405	Subject : **Principles of Communication Engineering**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Outline and identify and solve basic communication system.
2	Distinguish different modulation and demodulation techniques used in analog communication andthe concept of noise.
3	Explain transmitter and receiver circuits used in analog communication systems.
4	Illustrate Pulse communication and importance of sampling techniques in communication system.
5	Compare design issues, advantages, disadvantages and limitations of analog and digital communication systems.
6	Formulate the principle of multiplexing techniques

Subject code:**EC C404**	Subject Name **:Signals & Systems**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Understand the concept & types of signals, classification of signals.
2	Analyze the classification of signals & systems through examples.
3	Compute the time domain analysis of continuous & discrete time system
4	Perform the knowledge of frequency domain analysis of continuous & discrete time system
5	Analyze the discrete time LTI system using Z transform
6	Express the concept of state, state variables & application of signals & system

Subject code:**ECC403**	Subject Name:**Linear Integrated Circuits**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Explain various current mirror circuits and illustrate differential amplifier with active load.
2	Describe characteristics as well as linear and nonlinear applications of Op-amps.
3	Construct and compare different ADCs and DACs.
4	Recognize and design specific application using special purpose IC.
5	Design circuits for performing different mathematical operations.
6	Construct voltage regulator circuits.

Class-TE

Subject code:**ECC603**	Subject Name**: Antenna and Radio Wave Propagation**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Interpret basic parameters of antenna.
2	Demonstrate/analyse different parameters of wire antennas
3	Justify the concept of antenna arrays and pattern multiplication.
4	Classify different special types of antennas.
5	Analyze the antenna measurement technique and radio wave propagation.
6	Explain the concept of Microstrip antennas.

Subject code:**ECC602**	Subject Name**: Computer Communication Networks**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Design a small or medium sized computer network including media types, end devices, and interconnecting devices that meets a customer ‘s specific needs.
2	Perform basic configurations on routers and Ethernet switches.
3	Demonstrate knowledge of programming for network communications.
4	Learn to simulate computer networks and analyze the simulation results.
5	Troubleshoot connectivity problems in a host occurring at multiple layers of the OSI model.
6	Develop knowledge and skills necessary to gain employment as computer network engineer and network administrator.

Subject code:**ECC601**	Subject Name**: Microcontroller and Applications**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Understand detailed architecture of 8051 Microcontroller.
2	Classify/Illustrate different types of algorithm for microcontroller and it’s application.
3	Use/Apply the knowledge to interface various peripheral devices with microcontroller.
4	Understand detailed architecture of 8051 Microcontroller.
5	Classify/Illustrate different types of algorithm for ARM 7.
6	Develope programmes in ARM 7 using embedded C.

Subject c ode:ECCDLO6021	Subject Name : **Digital VLSI Design**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Realize logic circuits with different design styles.
2	Understand operation of memory, storage circuits and data path elements.
3	Interpret Adders, Multipliers and shifters using logic design styles.
4	Demonstrate an understanding of system level design issues such as protection, clocking and routing.
5	Simulate & Synthesize digital circuits using HDL Language.
6	Implement RTL designing for Practical Applications like High level state machine and FIR filter design.

Subject code:**ECC604**	Subject Name: **Image Processing & Machine Vision**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Describe mathematical models of digital image processing.
2	Classify/Illustrate different types of image transforms.
3	Use/Apply time and frequency domain techniques for image enhancement.
4	Identify and Use morphological and restoration techniques for image correction.
5	Analyse image segmentation techniques to recognize various shapes in an image.
6	Propose classification techniques in machine vision to classify objects.

Class BE

Subject code: **ETL802**	Subject Name: **Satellite Communication and Networks**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1.	State the basics of satellite communication.
2.	Express the operation of satellite communication system.
3.	Summarize the science behind the orbiting satellites, various multiplexing schemes and earth station parameters used for satellite communication.
4.	Explain and analyse link budget of satellite signal for proper communication
5.	Inculcate the aspects of satellite communication like orbital mechanism, earth station technology etc.
6.	Compare the different application of satellite communication.
	Translate the modern techniques used in satellite communication.
	Review satellite networking and satellite personal communication.

Subject code: **ETL803**	Subject Name**: Telecom Network and Management**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Acquire the basic principles of network management.
2	Realize the design, analysis, operations of modern data communication networks
3	Demonstrate management of modern communication networks.
4	Analyze the working knowledge of Broadband network management.
5	Understand essentials of telecommunication network management
6	Demonstrate the ability to design a network management system, its component or process as per needs and specification.

Subject code:**ETL801**	Subject Name**: Wireless Communication**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Apply their knowledge of various protocols and recent trends for wireless technologies.
2	Design various systems as an application to the various technologies studied.
3	Apply their knowledge of design and plan the RF networks.
4	Design of mobile wireless network and Phases of planning.
5	Understand the Sensor network architecture and WSN applications.
6	Illustrate the Middleware protocol and network management issues of sensor network.

Subject code:**ETC803**	Subject Name:**Internet and Voice Communication**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Implement LAN using static and dynamic addressing techniques.
2	Illustrate concept of encapsulation and its relationship to layering in network model.
3	Compare byte stream sliding window and traditional algorithm.
4	Illustrate routers, DHCP, routing function and switching function.
5	Describe internetworking layer of IP.
6	Demonstrate working of DNS in global internet including caching and root servers.

Mechanicl Engineering

Class SE/Odd sem

Subject: **MEC301**	Subject: **Applied Mathematics-III**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Demonstrate the ability of using Laplace Transform in solving the Ordinary Differential Equations and Partial Differential Equations.
2	Demonstrate the ability of using Fourier Series in solving the Ordinary Differential Equations and Partial Differential Equations.
3	Solve initial and boundary value problems involving ordinary differential equations.
4	Identify the analytic function, harmonic function, orthogonal trajectories.
5	Apply bilinear transformations and conformal mappings.
6	Identify the applicability of theorems and evaluate the contour integrals.

Subject:**MEC302**	Subject: **Thermodynamics**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Demonstrate application of the laws of thermodynamics to wide range of systems.
2	Write steady flow energy equation for various flow and non-flow thermodynamic systems.
3	Compute heat and work interactions in thermodynamics systems.
4	Demonstrate the interrelations between thermodynamic functions to solve practical problems.
5	Use steam table and mollier chart to compute thermodynamics interactions.
6	Compute efficiencies of heat engines, power cycles etc.

Subject:**MEC303**	Subject: **Strength of Materials .**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Demonstrate fundamental knowledge about various types of loading and stresses induced.
2	Draw the SFD and BMD for different types of loads and support conditions.
3	Analyze the stresses induced in basic mechanical components.
4	Estimate the strain energy in mechanical elements.
5	Analyze the deflection in beams.
6	Analyze buckling and bending phenomenon in columns, struts and beams.

Subject:**MEC304**	Subject: **Production Processes**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Demonstrate understanding of casting process.
2	Illustrate principles of forming processes.
3	Demonstrate applications of various types of welding processes.
4	Differentiate chip forming processes such as turning, milling, drilling, etc.
5	Illustrate the concept of producing polymer components and ceramic components.
6	Distinguish between the conventional and modern machine tools.

Subject:**MEC305**	Subject: **Material Technology**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Identify various crystal imperfections, deformation mechanisms, and strengthening mechanisms.
2	Demonstrate understanding of various failure mechanisms of materials.
3	Interpret Iron-Iron carbide phase diagram, and different phases in microstructures of materials at different conditions.
4	Select appropriate heat treatment process for specific applications.
5	Identify effect of alloying elements on properties of steels.
6	Illustrate basics of composite materials, Nano- materials and smart materials.

Subject:**MEL301**	Subject: **Computer Aided Machine Drawing**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Visualize and prepare detail drawing of a given object.
2	Read and interpret the drawing.
3	Draw details and assembly of different mechanical systems.
4	Convert detailed drawing into assembly drawing using modelling software.
5	Convert assembly drawing into detailed drawing using modelling software.
6	Prepare detailed drawing of any given physical object/machine element with actual measurements.

Class-TE

Subject code:**MEC501**	Subject Name **: Internal Combustion Engines**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Demonstrate the working of different systems and processes of S.I. engines
2	Demonstrate the working of different systems and processes of C.I. engines
3	Illustrate the working of lubrication, cooling and supercharging systems.
4	Analyze engine performance.
5	Illustrate emission norms and emission control.
6	Comprehend the different technological advances in engines and alternate fuels.

Subject code:**MEC502**	Subject Name**: Mechanical Measurement and Control**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Classify various types of static characteristics and types of errors occurring in the system.
2	Classify and select proper measuring instrument for linear and angular displacement.
3	Classify and select proper measuring instrument for pressure and temperature measurement.
4	Design mathematical model of system/process for standard input responses.
5	Analyze error and differentiate various types of control systems and time domain specifications.
6	Analyze the problems associated with stability.

Subject code:**MEC503**	Subject Name **: Heat Transfer**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Identify the three modes of heat transfer (conduction, convection and radiation).

2	Illustrate basic modes of heat transfer.
3	Develop mathematical model for each mode of heat transfer.
4	Develop mathematical model for transient heat transfer.
5	Demonstrate and explain mechanism of boiling and condensation.
6	Analyze different heat exchangers and quantify their performance.

Subject:**MEC504**	Subject: **Dynamics of Machinery**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Demonstrate working Principles of different types of governors and Gyroscopic effects on the mechanical systems.
2	Illustrate basic of static and dynamic forces.
3	Determine natural frequency of element/system.
4	Determine vibration response of mechanical elements / systems.
5	Design vibration isolation system for a specific application.
6	Demonstrate basic concepts of balancing of forces and couples.

Subject code: **MEDLO5012**	Subject **: Machining Sciences and Tool Design**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Calculate the values of various forces involved in the machining operations.
2	Design various single and multipoint cutting tools.
3	Analyze heat generation in machining operation and coolant operations.
4	Illustrate the properties of various cutting tool materials and hence select an appropriate tool material for particular machining application.
5	Demonstrate the inter-relationship between cutting parameters and machining performance measures like power requirement, cutting time, tool life and surface finish.
6	Analyze economics of machining operations.

Subject:**MEL506**	Subject: **Business Communication & Ethics**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Design a technical document using precise language, suitable vocabulary and apt style.
2	Develop the life skills/ interpersonal skills to progress professionally by building stronger Relationships.

3	Demonstrate awareness of contemporary issues knowledge of professional and ethical Responsibilities.
4	Apply the traits of a suitable candidate for a job/higher education, upon being trained in the techniques of holding a group discussion, facing interviews and writing resume/SOP.
5	Deliver formal presentations effectively implementing the verbal and non-verbal skills.
6	Develop overall professional skills

Class-BE

Subject code:**MEC701**	Subject Name**: Machine Design – II**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Select appropriate gears for power transmission on the basis of given load and speed.
2	Design gears based on the given conditions.
3	Select bearings for a given applications from the manufacturers catalogue.
4	Select and/or design belts and flywheel for given applications.
5	Design cam and follower mechanisms.
6	Design clutches and brakes.

Subject code:**MEC702**	Subject Name **: CAD/CAM/CAE**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Identify proper computer graphics techniques for geometric modelling.
2	Transform, manipulate objects & store and manage data.
3	CAM Toolpath Creation and NC- G code output.
4	Use rapid prototyping and tooling concepts in any real life applications.
5	Identify the tools for Analysis of a complex engineering component.
6	Develop professional skills needed for industry.

Subject code: **MEC703**	Subject Name**: Production Planning and Control.**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Illustrate production planning functions and manage manufacturing functions in a better way.
2	Develop competency in scheduling and sequencing of manufacturing operations.
3	Forecast the demand of the product and prepare an aggregate plan.
4	Develop the skills of Inventory Management and cost effectiveness.

5	Create a logical approach to Line Balancing in various production systems.
6	Implement techniques of manufacturing planning and control.

Subject code: **MEDLO7032**	Subject Name: **AUTOMOBILE ENGINEERING**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Illustrate the types and working of clutch and transmission system.
2	Demonstrate the working of different types of final drives, steering gears and braking systems.
3	Illustrate the constructional features of wheels, tires and suspension systems.
4	Demonstrate the understanding of types of storage, charging and starting systems.
5	Identify the type of body and chassis of an automobile.
6	Comprehend the different technological advances in automobile.

Subject code:**ILO7013**	Subject Name: **Management Information System**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Explain how information systems Transform Business
2	Identify the impact information systems have on an organization
3	Describe IT infrastructure and its components and its current trends
4	Understand the principal tools and technologies for accessing information from databases to improve business performance and decision making
5	Identify the types of systems used for enterprise-wide knowledge management and how they provide value for businesses
6	Implementation of management information systems

Class SE/Even sem

Subject:**MEC401**	Subject: **Applied Mathematics IV**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Solve the system of linear equations using matrix algebra with its specific rules.
2	Demonstrate basics of vector calculus.
3	Apply the concept of probability distribution and sampling theory to engineering problems.
4	Apply principles of vector calculus to the analysis of engineering problems.
5	Identify, formulate and solve engineering problems.
6	Illustrate basic theory of correlations and regression.

Subject: **MEC402**	Subject: **Fluid Mechanics**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Define properties of fluids and classification of fluids.
2	Evaluate hydrostatic forces on various surfaces and predict stability of floating bodies.
3	Formulate and solve equations of the control volume for fluid flow systems.
4	Apply Bernoulli's equation to various flow measuring devices.
5	Calculate resistance to flow of incompressible fluids through closed conduits and over surfaces.
6	Apply fundamentals of compressible fluid flows to relevant systems.

Subject code:**MEC403**	Subject Name **: Industrial Electronics**	Credits:04

1	Illustrate construction, working principles and applications of power electronic switches.
2	Identify rectifiers and inverters for dc and ac motor speed control.
3	Develop circuits using OPAMP and timer IC555.
4	Identify digital circuits for industrial applications.
5	Illustrate the knowledge of basic functioning of microcontroller.
6	Analyze speed-torque characteristics of electrical machines for speed control.

Subject code:**MEC404**	Subject Name: **Production Process II**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Demonstrate understanding of metal cutting principles and mechanism.
2	Identify cutting tool geometry of single point and multipoint cutting tool.
3	Demonstrate various concepts of sheet metal forming operations.
4	Demonstrate concepts and use of jigs and fixtures.
5	Illustrate various non-traditional machining techniques.
6	Illustrate concepts and applications of additive manufacturing.

Subject:**MEC405**	Subject: **Kinematics of Machinery**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Define various components of mechanisms
2	Develop mechanisms to provide specific motion
3	Draw velocity and acceleration diagrams of various mechanisms
4	Draw Cam profile for the specific follower motion

5	Analyse forces in various gears
6	Select appropriate power transmission for specific applications.

Subject: **MEL401**	Subject: **Data Base and Information Retrieval**	Credits:02

Course Outcomes:

At the end of course, students will attain an ability to:

1	Identify data models and schemes in DBMS
2	Demonstrate the features of database management systems and Relational database
3	Use SQL- the standard language of relational databases
4	Demonstrate understanding of functional dependencies and design of the database
5	Design graphical user Interface for specific application
6	Create visual software entities.

Class TE

Subject code:**MEC601**	Subject Name **: Metrology and Quality Engineering**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Demonstrate inspection methods and different gauges
2	Illustrate working principle of measuring instruments and calibration methodology
3	Illustrate basic concepts and statistical methods in quality control
4	Demonstrate characteristics of screw threads, gear profile, and tool profile
5	Illustrate the different sampling techniques in quality control
6	Illustrate different nondestructive techniques used for quality evaluation

Subject code:**MEC602**	Subject Name**: MACHINE DESIGN – I**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Demonstrate understanding of various design considerations.
2	Illustrate basic principles of machine design.
3	Design machine elements for static as well as dynamic loading.

4	Design machine elements on the basis of strength/ rigidity concepts.
5	Use design data books in designing various components.
6	Acquire skill in preparing production drawings pertaining to various designs.

Subject code:**MEC603**	Subject Name **: Finite Element Analysis**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Solve differential equations using weighted residual methods
2	Develop the finite element equations to model engineering problems governed by second order differential equations
3	Apply the basic finite element formulation techniques to solve engineering problems by using one dimensional elements
4	Apply the basic finite element formulation techniques to solve engineering problems by using two dimensional elements
5	Apply the basic finite element formulation techniques to find natural frequency of single degree of vibration system
6	Use commercial FEA software, to solve problems related to mechanical engineering

Subject code: **MEC604**	Subject Name: **Refrigeration and Air Conditioning**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Demonstrate fundamental principles of refrigeration and air conditioning.
2	Identify and locate various important components of the refrigeration and air conditioning system
3	Illustrate various refrigeration and air conditioning processes using psychometric chart
4	Design Air Conditioning system using cooling load calculations.
5	Estimate air conditioning system parameters
6	Demonstrate understanding of duct design concepts

Subject code: **MEDLO6021**	Subject Name **: Mechatronics**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Identify the suitable sensor and actuator for a mechatronics system .
2	Select suitable logic controls.
3	Analyze continuous control logics for standard input conditions.
4	Develop ladder logic programming.
5	Design hydraulic/pneumatic circuits.
6	Design a mechatronic system.

Subject code:**MEC801**	Subject Name**: Design of Mechanical Systems**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Apply the concept of system design.
2	Design material handling systems such as hoisting mechanism of EOT crane,
3	Design belt conveyor systems
4	Design engine components such as cylinder, piston, connecting rod and crankshaft
5	Design pumps for the given applications
6	Prepare layout of machine tool gear box and select number of teeth on each gear

Subject code:**MEC802**	Subject Name**: Industrial Engineering and Management**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Illustrate the need for optimization of resources and its significance.
2	Develop ability in integrating knowledge of design along with other aspects of value addition in the conceptualization and manufacturing stage of various products.
3	Demonstrate the concept of value analysis and its relevance.
4	Manage and implement different concepts involved in method study and understanding of work content in different situations.
5	Describe different aspects of work system design and facilities design pertinent to manufacturing industries.
6	Illustrate concepts of Agile manufacturing, Lean manufacturing and Flexible manufacturing

Subject code:**MEC803**	Subject Name**: Power Engineering**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Compute heat interactions in combustion of reactive mixtures
2	Differentiate boilers, boiler mountings and accessories
3	Calculate boiler efficiency and assess boiler performance
4	Demonstrate working cycles of gas turbines
5	Draw velocity triangles of impulse/reaction turbines and calculate performance parameters/efficiency
6	Demonstrate basic working of pumps

Subject code: **MEDLO8041**	Subject Name: **Power Plant Engineering**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Comprehend various equipment/systems utilized in power plants
2	Demonstrate site selection methodology, construction and operation of Hydro Electric Power Plants
3	Discuss working, site selection, advantages, disadvantages of steam power plants
4	Discuss operation of Combined Cycle Power Plants
5	Discuss types of reactors, waste disposal issues in nuclear power plants
6	Illustrate power plant economics

Subject code:**ILO8024**	Subject Name: **Human Resource Management**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Understand the concepts, aspects, techniques and practices of the human resource management.
2	Understand the Human resource management (HRM) processes, functions, changes and
3	Gain knowledge about the latest developments and trends in HRM.
4	Apply the knowledge of behavioral skills learnt and integrate it with in inter personal and intergroup environment emerging as future stable engineers and managers.
5	Apply HRM skills.
6	Analyze personal and professional skills.

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Class SE

Subject:**CE:C301**	Subject Name: **Applied Mathematics-III**	Credits:05

Course outcome:

At the end of course, students will attain an ability to:

1	Demonstrate the ability of using Laplace Transform in solving the Ordinary Differential Equations and Partial Differential Equations.
2	Evaluate Fourier Series in solving the Ordinary Differential Equations and Partial Differential Equations.
3	Solve initial and boundary value problems involving ordinary differential equations.
4	Identify the analytic function, harmonic function, orthogonal trajectories.
5	Apply bilinear transformations and conformal mappings.
6	Implement theorems and calculate the contour integrals.

Subject:**CE:C302**	Name of Subject: **Surveying-I**	Credits: 05

Course outcome

At the end of course, students will attain an ability to**;**

1	Measure Linear measurements, chaining, ranging and offsetting and apply corrections
2	Determine the observing bearings, compute included angles and do corrections for Local Attraction
3	Calculate vertical distances, determine RL and identify & choose suitable types of levelling
4	Computation of areas and volumes by Plane Table Survey
5	Calculation of consecutive and independent co-ordinates by drawing the traverse and preparing Gale's Table by reproducing the omitted measurements
6	Analyse the obtained data and compute areas and volumes and represent data on plane surfaces as contours.

Subject: **CEC303**	Name of Subject: **Strength of Materials**	Credits:05

Course outcome:

At the end of course, students will attain an ability to**;**

1	Determine the engineering properties for metals and non-metals and the strains induced
2	Understand the concepts of shear force, bending moment, axial force for statically determinate beams and compound beams having internal hinges; and subsequently, its application to draw the shear force, bending moment and axial force diagrams
3	Identify the flexural members for its structural behavior under the effect of flexure (bending),
4	Generate the behavior of the structural member under the action of shear and torsion either independently or in combination thereof
5	Study the deformation behavior of axially loaded columns having different end conditions and further, evaluate the strength of such columns.
6	Develop the concepts of principal plains and stresses and thin cylindrical and spherical shells and apply to solve the problems.

Subject: **CE:C304**	Name of Subject: **Engineering Geology**	Credits:04

Course outcome

At the end of course, students will attain an ability to**;**

1	Understand the significance of geological studies of seismic waves, agent modifying the earth's surface and action of wind, river, etc. on rocks.
2	Demonstrate the knowledge of geology to explain major geological process such as formation of mountain, ocean and occurrence and distribution of earthquake and volcanoes.
3	Analyze classification of minerals and rocks in terms of minerology and petrology.
4	Identify various geological structures like folds, faults, joints, etc. unconformity, their origin and distribution.
5	Apply methods of surface, sub-surface, investigation and advantages caused due to geological condition during the construction of dam and tunnel. Understand the causes and prevention of natural hazard like earthquake, volcano, landslide, etc
6	Prepare effective reports mentioning advantages and disadvantages caused due to geological condition and can evaluate any site for engineering project.

Class:SE

Subject code: **CEC305**	Subject Name: **Fluid Mechanics-I**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Define various properties of fluids, state and explain different types of laws and principal of fluid mechanics.
2	Interpret different forms of pressure measurement and calculate hydrostatic force and its location for a given geometry and orientation of plane surface.
3	Compute force of buoyancy on a partially or fully submerged body and analyse the stability of a floating body.
4	Distinguish velocity potential function and stream function and solve for velocity and acceleration of a fluid at a given location in a fluid flow.
5	Derive Euler's Equation of motion and Deduce Bernoulli's equation.
6	Measure velocity and rate of flow using various devices.

Class TE

Subject code: **CEC501**	Subject Name: **Structural Analysis-II**	Credits:05

Course Outcomes:

At the end of course, students will attain an ability to:

1	Calculate the degree of indeterminacy of indeterminate structures such as beam, frame and truss.
2	Compute the stresses due to temperature variations in the structures (frame).
3	Analyze the indeterminate structure by force methods and developing the elastic curve in beams and frames under the action of loads.
4	Use the concepts of displacement method to obtain the solution of indeterminate structures.
5	Understand and explain the concept of plastic hinge, plastic moment carrying capacity, shape factor and collapse load for single and multiple span beams.
6	Demonstrate the ability to extend in the analysis of frames by approximate methods.

Subject code: **CEC502**	Subject Name: **Geotechnical Engineering-I**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Understand the soil types index and engineering properties and relationship between various unit weights and another parameter.
2	Classify the soil with a view towards assessing the suitability of a given soil for use, either to use if to support a structure or to construct a structure therein.
3	Extend the use of Geosynthetic in soil to improve soil properties.
4	Evaluate the compression characteristics in laboratory and field hence interpret the result with compaction specification.
5	Interpret soil boring data for foundation design.
6	Conduct laboratory experiments to collect, analyze, interpret and present data

Subject code:**CEC503**	Subject Name: **Applied Hydraulics**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Apply the concept of dynamics of fluid flow to solve pipe bends and sprinkler problems.
2	Analyze the mathematical techniques used in dimensional analysis for design conducting model test.
3	Identify the dynamic behavior of fluid flow analyzed by Newton's second law of motion in case of flat, inclined, curved plates and propulsion of ships.
4	Discuss the different hydraulic machines like centrifugal pumps, reciprocating pumps and turbines
5	Explain the basic concept of open channel hydraulics and measure discharge through open channel for uniform flow.
6	Examine the occurrence of hydraulic jump and gradually varied flow and analyzing their parameters.

Subject code: **CEC504**	Subject Name: **Environmental Engineering-I**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Explain water supply system, its components and water demand by various consumers.
2	Determine the quality of water by various tests.
3	Illustrate different processes in water treatment facility and design different units for water treatment plants.
4	Discuss components of building water supply system.
5	Classify different rain water harvesting methods.
6	Interpret problems of air and noise pollution besides they will be prepared to contribute practical solution to environmental problems in our society.

Subject code: **CEDLO5062**	Subject Name: **Advance Concrete Technology**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Explain the various materials and properties in concrete.
2	Identify the various properties of special concrete and its use in modern construction.
3	Evaluate and implement the Mix design by different methods.
4	Apply the knowledge of fiber Reinforced Concrete in design.
5	Describe the different procedures to carry out tests on concrete.
6	Illustrate the durability of concrete.

Subject code: CE-DLO5063	Subject Name: Building Services and Repairs	Credits: 04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Understand various machineries like lift, escalator, vibrator, concrete mixers etc
2	Examine the causes of fire and suggest safety measures for fire and understand plumbing system
3	Outline different electrical services in buildings
4	Interpret the causes of deterioration of concrete structures
5	Assess the structural health of building and infra structural works
6	Implement techniques for repairing and employ methods of steel protection in the field

Subject code:CE507	Subject Name: Business & Communication Ethics	Credits: 02

Course Outcomes:

At the end of course, students will attain an ability to:

1	Illustrate a technical document using precise language, suitable vocabulary and appropriate style.
2	Demonstrate knowledge of professional and ethical responsibilities by effective communication in both verbal and written form.
3	Develop the life skills with key expertise to progress professionally by building stronger relationships.
4	Sketch an entrepreneurial approach and ability for life-long learning. Demonstrate awareness of contemporary issues.
5	Apply the traits of a suitable candidate for pursuing higher education/ job interview, upon being trained in the techniques of presentation and Interview skills.
6	Deliver formal presentations, effectively implementing the verbal and non-verbal skills. Participate and succeed in Campus placements and competitive examinations

Class BE

Subject code:**CEC702**	Subject: Theory of Reinforced Concrete Structures	Credits:06

Course Outcomes:

At the end of course, students will attain an ability to:

1	Understand the pros and cons of the ULM and LSM vis-à-vis Working Stress method (WSM) studied in semester VI.
2	Implement the various clauses in IS:456 in designing the RCC structural member.
3	Apply the concepts of LSM in analyzing and designing the beams in flexure and shear.
4	Design the one way and two-way slab.
5	Develop the interaction curve and design the column.
6	Appraise the designing of different footings.

Subject code:**CEC702**	Subject: **Quantity Survey Estimation and Valuation**	Credits:05

Course Outcomes:

At the end of course, students will attain an ability to:

1	Read, understand and interpret plans, sections, detailed drawings and specifications for a construction project.
2	Prepare approximate and detailed estimates based on the quantity survey of the available general and detailed drawings.

3	Draft specifications, make bar bending schedules and draw mass haul diagrams.
4	Create rate analysis for various items: standard and non-standards with the help of DSR in this process.
5	Implement the arbitration process to resolve the ambiguity between two parties.
6	Understand the role of valuer and assess of the value of a property.

Subject code: CE- 703	Subject Name: Water Resource Engineering -II	Credits:05

Course Outcomes:

At the end of course, students will attain an ability to:

1	Design the section of gravity dams, earth and rockfill dams, arch dams and buttress dams.
2	Draw seepage line & understand the sweedish circle method
3	Illustrate design of a spillways and energy dissipaters
4	Apply silt theories to design irrigation canals
5	Explain various types of canals and its maintenance
6	Sketches of different cross drainage works of a canal system

Subject code: CE- DLO 7042	Subject Name:Solid Waste Management	Credits:05

Course Outcomes:

At the end of course, students will attain an ability to:

1	Explain generation, storage, collection, transfer and transport, processing, recovery and disposal in the management of solid waste.
2	Understand the characteristics of different types of solid waste and the factors affecting variation.
3	Identify the methods of collection, storage and transportation of solid waste
4	Outline the suitable technical solutions for processing of wastes.
5	Ability to plan waste minimization and disposal of municipal solid waste.
6	Recognize the safe handling and treatment of Hazardous, Electronic and Biomedical waste.

Subject code:CEC-ILOC7017	Subject Name:Disaster Management and Mitigation Measures	Credits:03

Course Outcomes:

At the end of course, students will attain an ability to:

1	Understand the various types of disaster occurring around the world.

2	Get to know natural and manmade disaster and their extent and possible effects on the economy.
3	Get acquainted with government policies, acts and various organizational structure associated with an emergency.
4	Get to know the institutional framework and GIS application in disaster management.
5	Able to analyse the various ways to raise the funds for relief operations.
6	Get to know the simple do's and don'ts in such extreme events and act accordingly.

Subject code: ILO7016	Subject Name: Cyber Security and Laws	Credits:03

Course Outcomes:

At the end of course, students will attain an ability to:

1	Propose the concept of cybercrime and its effect on outside world.
2	Classify various security challenges in electronic device for different types of attack.
3	Use different tools and methods in Cyber Offenses
4	Distinguish different aspects of cyber law.
5	Interpret and apply IT law in various legal issues
6	Categorize Information Security Standards compliance during software design and development

Class SE

Subject code:**CE:C401**	Subject Name**: Applied Mathematics-IV**	Credits:05

Course Outcomes:

At the end of course, students will attain an ability to:

1	Examine and calculate the system of linear equations using matrix algebra with its specific rules
2	Demonstrate basics of vector calculus

3	Apply the concept of probability distribution and sampling theory to engineering problems
4	Use principles of vector calculus to the analysis of engineering problems.
5	Identify, formulate and solve engineering problems
6	Illustrate basic theory of correlations and regression

Class SE-even sem

Subject code: **CEC402**	Subject Name: **Surveying -II**	Credits:4.5

Course Outcomes:

At the end of course, students will attain an ability to:

1	Survey of different curves by using angular, theodolites and Rankine's deflection methods.
2	Measure the sight distance by tangent correction and chord gradient methods.
3	Determine the horizontal and vertical control, setting out a foundation plans with theodolite.
4	Classify the special survey instruments.
5	Distinguish modern methods of surveying using GPS, remote sensing, GIS, etc.
6	Identify the legal documents and role of revenue department in maintaining survey records.

Class SE even sem

Subject code: **CEC403**	Subject Name:**Structural Analysis-I**	Credits:05

Course Outcomes:

At the end of course, students will attain an ability to:

1	Analyse statically determinate portal frames and plot SFD/BMD for them.
2	Understand beams and frames for rotation and displacements using various methods.
3	Identify structures like3 hinged arches, cable and suspension bridges and girders.
4	Learn column struts and their buckling behaviour under loading conditions.
5	Apply rolling loads over beams and trusses in order to find the reactions.

6	Compute unsymmetrical bendings of structural members and evaluate shear centers for same.

Subject code:**CEC404**	Subject Name**: Building Design and Drawing**	Credits: 3.5

Course Outcomes:

At the end of course, students will attain an ability to:

1	Define, evaluate and apply the principles and code of practices for planning and designing of residential buildings and study the various building components and building services.
2	Study the designing of dog legged as well as open newel staircase.
3	Define and draw one point and two-point perspective.
4	Study the concept of town planning, architectural planning and built environment.
5	Understand the concept of Green buildings.
6	Define, evaluate and apply the principles and code of practices for planning and designing of various public buildings and study the various components and building services as well as apply the knowledge of overall planning and designing by using CAAD software.

Subject:**CEC405**	Subject: **Building Materials and Construction Technology**	Credits: 05

Course outcome:

At the end of course, students will attain an ability to:

1	Identify and list the various building materials, their properties and symbols
2	Illustrate and interpret manufacturing process of basic construction materials
3	Learn the properties of ingredients of concrete and types of admixture.
4	Classify the types and uses of glasses and defects in timber.
5	Design and interpret concrete mix for various grades.
6	Distinguish various masonry construction, finishes and formworks.

Subject:**CEC406**	Subject: **Fluid Mechanics II**	Credits: 04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Measure loss of head through pipes, pipe network and water hammer
2	Determine the flow through nozzles.
3	Compute compressible flow in a fluid.
4	Justify the development of boundary layer over surfaces.
5	Distinguish laminar flow through pipes and between the plates.
6	Rate the resistance to flow in smooth and rough pipes.

Class TE-Evene sem

Subject code: **CE:C604**	Subject Name: **Environmental Engineering-II**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Formulate approaches towards wastewater collection systems in buildings and municipal areas and to determine the quantity of wastewater and storm water production. Also, gain the knowledge of the construction of new sewer line and importance of sewer appurtenances.
2	Analyze the characteristics of wastewater and design the primary treatment for wastewater.
3	Apply on-site treatment methods and solve Analyze and design wastewater treatment systems(ASP, Aerated lagoon and Oxidation ponds).
4	Identify and apply proper treatment for reclamation and reuse of wastewater and disposal.
5	Generalize various sludge treatment methods and its disposal methods.

6	Provide knowledge of solid waste collection system, characteristics of solid waste and to identify hazardous waste.

Subject code: **CEC601**	Subject Name: **Geotechnical Engineering-II**	Credits:05

Course Outcomes:

At the end of course, students will attain an ability to:

1	Appraise the consolidation parameters for the soil.
2	Calculate the shear strength parameters for the soil
3	Differentiate the factors of safety of different types of slopes under various soil conditions and infer the stability of slopes, retaining walls & lateral earth pressures.
4	Interpolate the bearing capacity of shallow foundation using theoretical and field methods also formulate the load bearing capacity of individual as well as group of pile foundations and their settlement using theoretical and field methods.
5	Extend the conduits and calculate the load carried by the struts of a braced cut under various soil conditions.
6	Defend the ground improvement techniques.

Subject code:**CE:C603**	Subject Name: **Transportation Engineering II**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Examine the components of permanent way and its construction, yards, modernization of railway track.
2	Identify the concept of geometric design of railway track and railway traffic control.
3	Classify airport planning, obstructions and orientation of runway.
4	Distinguish the concept of geometric design of runway, taxiway, etc. and the knowledge of various signaling system for air traffic control.
5	Differentiate the system of water transportation, types of breakwater, harbours and port facilities equipment
6	Determine the basic idea about the bridge engineering.

Subject code:**CE:C602**	Subject Name**: Design and Drawing of Steel Structures**	Credits:05

Course Outcomes:

At the end of course, students will attain an ability to:

1	Analyse and design bolted and welded connections.
2	Understand and carry out the design of tension and compression members.
3	Implement design of laced and battened built up steel columns.
4	Design slab base and gusseted bases for columns
5	Identify and design laterally supported and unsupoorted beam sections
6	Apply design of steel roof truss and welded plate girders for industrial buildings.

Subject code:**CE:C605**	Subject Name: **Water Resources Engineering-I**	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Classify various types of irrigation projects
2	Extend the different irrigation methods and effective use of water resources.
3	Calculate the crop water requirements and irrigation requirement.
4	Derive hydrographs and calculate runoff of a catchment area.
5	Explain the steady state and unsteady state conditions of any aquifer and design water wells.
6	Estimate the capacity of a reservoir for different purposes.

Subject code: CEC607	Subject Name: Software Applications in Civil Engineering	Credits:01

Course Outcomes:

At the end of course, students will attain an ability to:

1	Explain the use of software in various disciplines of civil engineering.
2	Demonstrate the ability to use the software in chosen field and provide solutions to field problems.
3	Evaluate the software results using judgement about range of answers.
4	Identify the software application in particular field of Civil Engineering
5	Discover open source software used in case of specific problems.
6	Select the software according to the nature and type of work

Subject code: CEDLO6061	Subject Name: Advanced Construction Equipment	Credits:04

Course Outcomes:

At the end of course, students will attain an ability to:

1	Understand the use/applications of various conventional construction equipments and select best out of them for a particular site requirement.
2	Discover the modern methods/equipments used for underground as well as underwater tunnelling.
3	Compare conventional and modern methods of formwork on the basis of productivity, reuse value, ease of erection and dismantling, flexibility offered and overall cost
4	Will have good knowledge about the Pipe line insertion systems, Methods of construction for bridges/flyovers etc
5	Gain knowledge and interpret about the setting up of different kinds of the power generating structures.
6	Inculcate the techniques involved and the equipments required thereof for construction of various transporting facilities.

Class BE-even sem

Subject code: **CE:C801**	Subject Name: **Design and Drawing of Reinforced Concrete Structures**	Credits:05

Course Outcomes:

At the end of course, students will attain an ability to:

1	Calculate the loads to analysis and design of Raft Foundation
2	Solve the design of different types of staircase using Limit State Method
3	Analysis and design of residential and industrial buildings individually or in a group by using relevant IS codes.
4	Justify the design of various retaining wall by Limit State Method.
5	Generate the complete design of Circular water tank using IS-code method and Approximate method using Working Stress Method.
6	Illustrate the complete design of Rectangular water tank using IS-code method and Approximate method using Working Stress Method.

Subject code:**CE:C803**	Subject Name:**Construction Management**	Credits:05

Course Outcomes:

At the end of course, students will attain an ability to:

1	Manipulate the knowledge of management functions like planning, scheduling, executing and controlling to construction projects.
2	Dramatize the knowledge of construction project by organizing & mobilize the sites in industry.
3	Demonstrate their capability for preparing the project networks to work out best possible time for completing the project.
4	Extend the exercise of time-cost relationship in practices.
5	Implement the safety as well as quality aspects during the execution of civil engineering
6	Inculcate the managerial skills in their future during actual execution of projects.

Subject code: CE- E804	Subject Name: Industrial Waste Treatment	Credits:05

Course Outcomes:

At the end of course, students will attain an ability to:

1	Explain the different characteristics of liquid waste generated from different industries, their sampling and analysis.
2	Understand the effect of industrial waste on self-purification and on environment of streams.
3	Analyze the general treatment of industrial waste like neutralization, equalization and segregation.
4	Explain the waste produced from different industries and their treatment.
5	Assess the environmental impact and environmental audit for industrial waste.
6	Design, operation and maintenance of common effluent treatment plants (CETPs)

Subject code: CE-C ILOC8028	Subject Name: Environmental Management	Credits: 03

Course Outcomes:

At the end of course, students will attain an ability to:

1	Identify causes and effects of major environmental issues and concerns.
2	Understand the concept of environmental management.
3	Understand ecosystem and interdependence between living organisms, food chain etc
4	Acquaint with the concept of Environment Management System, ISO 14001 standard, EMS Certification.
5	Acquire knowledge about the functions of Government for environment protection and management
6	Interpret environment related legislations.

Subject code: CE-C ILOC8021	Subject Name: Project Management Teaching Scheme	Credits:03

Course Outcomes:

At the end of course, students will attain an ability to:

1	Apply selection criteria and select an appropriate project from different options.
2	Able to start the project and create effective project team, and monitor the stagewise development and growth of the project.
3	Write work breakdown structure for a project and develop a schedule based on it.
4	Identify opportunities and threats to the project and decide an approach to deal with them strategically.
5	Use earned value technique and determine as well as predict the status of a project.
6	Capture lessons learned during project phases and document them for future reference.

FE

Subject code: FEC101	**Subject Name: Applied Mathematics -I**	**Credits:05**

Course Outcomes: At the end of course, students will attain ability to:

1	Use/Apply the concept of complex numbers to the engineering problem.
2	Evaluate nth order derivative of standard function.
3	Identify and use the principles of basic operations of matrices to the engineering problem.
4	Analyze the basic principles of partial differentiation to engineering problem.
5	Use the concept of partial differentiation as an application of successive differentiation.
6	Operate sci-lab programming techniques to model problems based on solutions of simultaneous linear algebraic equation.

Subject code: FEC102	**Subject Name: Applied Physics-I**	**Credits:3.5**

Course Outcomes: At the end of course, students will attain ability to:

1	Explain the concept of crystallography and apply it to different crystal structure
2	Distinguish various phases of Liquid crystals and defects in crystals.
3	Understand the principles of quantum mechanics and its key.
4	Apply semiconductor properties in electronic devices as well as to comprehend the concept of superconductors and their applications.
5	Learn the principle behind the acoustic design of a hall.
6	Learn the methods of production of ultrasonic and its applications in various field

Subject code: FEC103	Subject Name: Applied chemistry I	Credits: 3.5

Course Outcomes:

At the end of course, students will attain ability to:

1	Apply knowledge of applied chemistry in various areas of Engineering and Technology
2	Apply knowledge of purification methods for water treatment for benefit of society
3	Understand the designing and synthesis of specific industrial polymers for various fields
4	Student will able to select right type of lubricant depending upon its application on mobbing surfaces
5	Understand engineering materials such as cement, concrete, RCC,CNTS and fullerenes
6	Apply knowledge of Phase rule in studying different chemical systems

Subject code:FEC104	Subject Name: Engineering Mechanics	Credits: 06

Course Outcomes:

At the end of course, students will attain ability to:

1	Find resultant force and analyze equilibrium condition to find unknown reaction using appropriate FBD
2	Locate the centroid of a plain figure
3	Analyze dry friction in blocs, Edges and ladders
4	Find unknown motion parameters like velocity, acceleration, time, displacement distance by analytical and graphical method
5	Locate ICR of a mechanism and find angular and linear velocities of required point on required links
6	Use the DeAlembert's principle, work-energy, impulse-momentum Principles

Subject code:FEC105	Subject Name: Basic Electrical Engineering	Credits:05

Course Outcomes:

At the end of course, students will attain ability to:

1	Study D.C circuits using network theorems
2	Design the D.C circuits
3	Evaluate single phase A.C circuits
4	Illustrate constructional features and operation of single-phase transformer
5	Use design and analyze three phase A.C circuits
6	Know the concept of working principle of DC machines
7	Conduct experiments on DC circuits and AC circuits

Subject code: FEC106	Subject Name: Environmental studies	Credits: Theory 2

Course Outcomes:

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

1	The core concept of multidisciplinary nature of environmental studies.
2	Appreciate environmental issues and interaction across the social and environmental process
3	Reflect critically about their roles and responsibilities to minimize pollution
4	Rules and regulations to protect environment.
5	Will be able to apply the knowledge of using renewable resources to save nonrenewable resources.
6	Apply the knowledge science and technology to save them from various natural disasters.

Subject code:FEC201	Subject Name: Applied Mathematics -II	Credits:05

Course Outcomes:

At the end of course, students will attain ability to:

1	Propose the appropriate function and technique to differentiate under integral sign.
2	Solve and analyze the D.E and its application in related field of engineering.
3	Compute the limits of integration from given equation of curves and analyze the area and mass of lamina.
4	Analyze and find the volume of solid by using triple integration.
5	Classify various types of numerical methods for solving D.E
6	Use the knowledge of different methods to solve higher order D.E

Subject code: FEC202	Subject Name: Applied Physics -II	Credits:3.5

Course Outcomes:

At the end of course, students will attain ability to:

1	Ability to demonstrate competency & understanding of basic concepts of Physics like– Optics, Lasers, Fiber optics, Electrodynamics, nanotechnology.
2	Comprehend the concept of interference and Diffraction and their applications.Evaluate the values in various cases of interference and diffraction
3	Apply the working principles of optical fiber, Laser and their applications in emerging technology. Evaluate the values of NA and V-no.
4	Understand electrodynamics, Maxwell's equations and their applications. And able to solve the problems.
5	Comprehensive mathematical execution of terms Electrostatic and Magneto static focusing and applications of CRO.
6	Assimilate knowledge of the Nanotechnology and tools used SEM, TEM, and AFM.

Subject code: FEC203	Subject Name: Applied Chemistry II	Credits: 3.5

Course Outcomes:

At the end of course, students will attain ability to:

1	Identify types of corrosion and factors affecting it related to problems affecting all industries.
2	Identify different types of corrosion control methods to study corrosion control in various industries.
3	Apply the knowledge of different types of fuels, including their production and refining methods and combustion mechanisms.
4	Illustrate composition and properties of different types of alloys and the process of powder metallurgy.
5	Illustrate principals of green chemistry.
6	Illustrate properties and applications of different types of composite materials

Subject code: FEC204	Subject Name: Engineering Drawing	Credits: 03

Course Outcomes:

At the end of course, students will attain an ability to:

1	Handle various manual drawing instruments, identify various lines, apply it whenever required
2	Apply the basic principles of projection in 2D drawing as well as in converting 3D views to 2D views
3	Read a given Drawing
4	Visualize an object from the given two views
5	Use CAD tools to draw different views of 3D object and to draw object in 3D after visualizing from 2D

Subject Code : FEC205	Subject Name :SPA	Credits:05

Course outcome:

At the end of cource student will attain an ability to:

1	Illustrate the basic terminology used in computer programming.
2	Apply different data types, variables and operators in a C program.
3	Design and implement control statements and looping constructs in C.
4	Apply function concept on problem statement.
5	Use different data structures.
6	Apply pointers and create/update data file.

Subject code: FEC206	Subject Name: Communication Skill	Credits: 03

Course Outcomes:

At the end of course, students will attain ability to:

1	Understand and evaluate information they listen to and express their ideas with greater clarity.
2	Apply proper skills to speak and respond efficiently along with the various channels of communication in a business organization.
3	Develop proper speech and speak convincingly before an audience with the help of an expanded vocabulary and enhanced digital content.
4	Sketch a professional approach and ability for life-long learning. Demonstrate awareness of LSRW skills.
5	Illustrate the traits of enhanced communication skills through result oriented writing both within and outside the organization.
6	Deliver formal presentations, effectively implementing the paralanguage skills, technical description, instructions and convey the same using global information technology.