

## SHIVAJIRAO S. JONDHLE COLLEGE OF ENGINEERING &amp; TECHNOLOGY, ASANGAON

NAAC Accredited B++

## List of PSO's for all Department for AY 2018-19

Sr.No.	Name of Department	List Of PSO's
1	ELECTRONICS AND TELECOMMUNICATION ENGG	<b>PSO 1:</b> Apply fundamentals of electronics in various domains of analog and digital systems.
		<b>PSO 2:</b> Build a model by applying profound knowledge in Communication, Signal Processing, Image Processing and VLSI along with programming & simulation tools for research and advancement.
		<b>PSO 3:</b> Analyze and research appropriate technologies for implementation of the electronics and telecommunication engineering systems and exhibits the soft skills for the presentation of the systems.
2	COMPUTER ENGINEERING	<b>PSO 1: Professional Skills:</b> The ability to understand, analyze and develop computer programs in the areas related to algorithms, system software, multimedia, web design, big data analytics, and networking for efficient design of computer-based systems of varying complexity
		<b>PSO 2: Problem-Solving Skills:</b> The ability to apply standard practices and strategies in software project development using open-ended programming environments to deliver a quality product for business success
		<b>PSO 3: Successful Career and Entrepreneurship:</b> The ability to employ modern computer languages, environments, and platforms in creating innovative career paths to be an entrepreneur, and a zest for higher studies.
3	MECHANICAL ENGINEERING	<b>PSO 1:</b> Students should be able to solve problems in the field of design, thermal and Production Engineering.
		<b>PSO 2:</b> Students should be able to analyze mechanical systems and simulate using Software
		<b>PSO 3:</b> Students should be able to resolve issues related to renewable energy sources and contribute to reduce atmospheric pollution
4	CIVIL ENGINEERING	<b>PSO1 :</b> The graduates will have the ability to plan, analyze, construct and maintain cost effective civil engineering structures.
		<b>PSO2:</b> The graduates will have the ability to take up employment, entrepreneurship, research and development for sustainable civil society.
		<b>PSO3 :</b> The graduates will have the ability to recognize the need of the hour like housing, sanitation, waste management, irrigation, use of renewable energy etc. for a sustainable environment.

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## List of PO's for all Department for AY 2018-19

Sr.No	List of PO's
1	<b>PO1.Engineering knowledge:</b> Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2	<b>PO2. Problem analysis:</b> Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3	<b>PO3. Design/development of solutions:</b> Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4	<b>PO4. Conduct investigations of complex problems:</b> Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5	<b>PO5. Modern tool usage:</b> Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6	<b>PO6. The engineer and society:</b> Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7	<b>PO7. Environment and sustainability:</b> Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8	<b>PO8. Ethics:</b> Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9	<b>PO9. Individual and team work:</b> Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10	<b>PO10. Communication:</b> Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11	<b>PO11. Project management and finance:</b> Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12	<b>PO12. Life-long learning:</b> Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

VIGHNAHARATA TRUSTS  
**SHIVAJIRAO S. JONDHLE COLLEGE OF ENGINEERING & TECHNOLOGY, ASANGAON**  
**NAAC Accredited B++**  
**DEPARTMENT OF FIRST YEAR ENGINEERING**  
 ACADEMIC YEAR 2018-19

YEAR:F.E.

SEM:I

SCHEME:CBCS

**COURSE OUTCOMES**

Learner will be able to

SR.No	SUBJECT	COURSE OUTCOMES
1	Applied Mathematics -I (FEC101)	Apply the knowledge of complex numbers to solve hyperbolic functions and separation of real and imaginary parts of a complex functions.
		Explain the concept of separation of real and imaginary parts of logarithm of complex number and apply the knowledge of successive differentiation to solve nth order derivative.
		Apply the knowledge of matrices for solving system of linear equations and coding and decoding of data.
		Demonstrate the skills of partial differentiation and identify the problem on Eulers theorem.
		Apply the concept of partial differentiation to find maxima and minima of a funtion.
		Demonstrate the skills of numerical methods to solve transcendental equation and system of linear equations.
2	Applied Physics-I (FEC102)	Explain the concept of crystallography & use X-Ray Diffraction technique for analysis of crystal structure.
		Explain fundamentals of Quantum Mechanics & use the knowledge of Quantum Mechanics to Uncertainty principle & motion of free particle.
		Extend the basic concepts of semiconductor physics & apply this knowledge to electronic devices like Light Emitting Diode & Solar cell.
		Apply the knowledge of Superconductivity to SQUID & MAGLEV.
		Define the principles behind the acoustic design of a hall & apply this in the proper design of a Hall/Auditorium.
		Apply the knowledge of Piezoelectric & Magnetostriction effect for the production of Ultrasonic waves & apply this knowledge in industry(cutting,welding,flaw detection),medical field.
3	Applied Chemistry-I (FEC103)	Find the percentage of impurities in water, apply the knowledge of types of hardness of water and its estimation.
		Apply the knowledge of various softening and disinfecting methods, understand methods of purification of water as per the standards.
		Illustrate the chemistry of polymers, apply the knowledge of various polymers, their synthesis, properties and uses along with their fabrication techniques.
		Explain mechanism of lubrication and Apply the knowledge of lubricants, types, properties and mechanisms to avoid frictional resistance.
		Apply the knowledge of thermodynamics in studying different chemical systems in equilibrium obeying Gibb's phase rule.
		Demonstrate the knowledge of Portland cement and carbon nanomaterials.
4	Basic Electrical Engineering (FEC104)	Define fundamentals of DC circuits and apply knowledge for analysing network theorems in DC circuits.
		Recall the fundamentals and analyse Single Phase AC circuits.
		Define the fundamentals and analyse Three Phase AC circuits.
		Find the basic operation and analyse the performance of Single Phase Transformer.
		Demonstrate & explain the construction and basic operation of DC motors and generators.
5	Engg.Mechanics (FEC105)	Relate basic concept that is needed by a Civil Engineering professional to solve complex engineering problems involved in the analysis and design of structures
		Identify free body diagrams and to calculate the reactions necessary to ensure static equilibrium.
		Solve mechanics problems associated with friction forces and space forces
		Interpret the motion of a particle in terms of its position, velocity and acceleration in different frames of reference and to analyze the forces causing the motion of a particle
		Develop concepts of rigid body kinematics and dynamics with an emphasis on the modeling, analysis, and simulation of how forces produce motion of rigid body systems..
		Solve simple dynamic problems involving kinetics, energy and momentum
6	Environmental Studies (FEC106)	Illustrate Depleting Nature of Environmental Resources, Global Environmental Crisis, Ecosystem concept.
		Adapt to 3R (Reuse, Recovery, Recycle)
		Compare different control measures related to Environmental Pollution.
		Illustrate and analyze various Case Studies related to Environmental Legislation.
		Demonstrate the working of Renewable energy sources & Equipments.
		Illustrate the Techniques of Disaster Management and Green Building.

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**DEPARTMENT OF FIRST YEAR ENGINEERING**

YEAR:F.E.

ACADEMIC YEAR 2018-19

SEM:II

SCHEME:CBCS

**COURSE OUTCOMES**

Learner will be able to

SR.No	SUBJECT	COURSE OUTCOMES
1	Applied Mathematics -II (FEC201)	Apply the concept of first order and first degree differential equation to solve electrical & mechanical engineering problems.
		Apply the concept of higher order linear differential equation to solve the engineering problems.
		Solve the Differential equations by numerical methods and utilize the knowledge of Beta and Gamma function to solve engineering problem.
		Evaluate integration by differentiation under integral signs & numerical integration methods such as Trapezoidal & Simpson's rule.
		Apply double integration to find area of surface.
		Find and analyse area, mass of lamina and volume of solid by using double and triple integration.
2	Applied Physics-II (FEC202)	Illustrate the principle of interference and diffraction & apply it to determine radius of curvature of lens & wavelength of source of light.
		Explain the principle of laser, types of laser & apply this knowledge in Holography, industry & medical field.
		Identify the types of Optical Fiber, losses in Optical Fiber & application of Optical Fiber in various field.
		Apply the basic concept of electrodynamics & Maxwell's equation in telecommunication engineering.
		Apply the concept of electromagnetism in focussing system & Cathode Ray Oscilloscope.
		Explain the significance of Nanoscience & Nanotechnology & explain construction of important tools in nanotechnology.
3	Applied Chemistry-II (FEC203)	Apply the knowledge of different types of fuels, including their production and refining methods and combustion mechanics.
		Analyze the quantity of air and oxygen required for the complete combustion of fuels and carry out analysis of fuels.
		Identify different types of corrosion and suggest control measures in industries.
		Illustrate composition and properties of different types of alloys and the process of powder metallurgy and understand the uses of various alloys.
		Illustrate principles of green chemistry and calculate atom economy by various methods of synthesis. Incorporate the knowledge of green synthesis of various chemicals.
		Explain the chemistry of composite materials. Illustrate properties and applications of different types of composite materials.
4	Engineering Drawing (FEC204)	Explain the basic principles of projections in 2D drawings and AUTO CAD.
		Apply the basic principles of projections in 2D drawings and AUTO CAD.
		Apply the basic principles of projections in converting 3D view to 2D drawing.
		Explain projection of solids, section of solids and Development of solids.
		Apply CAD tool to draw different views of a 3D object.
		Recall an object from the given two views and make use of CAD tool to draw an object in 3D.
5	Structured Programming Approach (FEC205)	Illustrate basic terminologies and various models of computation and will be able to write and draw algorithms and flowcharts.
		Illustrate the concept of data types, variables and operators using C.
		Explain the concept of flow of controls, Design and Implement control statements, branching and looping constructs in C.
		Illustrate and Apply function concept on problem statement and will be able to understand recursion.
		Explain the concept of flow of controls and program structures and will learn the use of arrays with structures and unions.
		Apply the knowledge of pointers and file operations.
6	Communication Skills (FEC206)	Explain the concept of business communication and ethics, Apply above studied concept in practical life & in business organization.
		Apply basic grammar in written and oral communication.
		Compare different writing formats of business letters and application in organizational communications.
		Summarising technical and industry related passages not more than 400 words.
		Explain technical objects, framing definition, writing instructions.
		Demonstrate the knowledge related to ICT(Information communication technology).

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## DEPARTMENT OF COMPUTER ENGINEERING

ACADEMIC YEAR 2018-19

YEAR: SE

SEM: III

SCHEME:CBCS

## COURSE OUTCOMES

On succesful completion of course learner will be able to

SR.NO.	SUBJECT	COURSE OUTCOMES
1	Applied Mathematics -III (CSC301)	Apply Laplace Transforms to solve Engineering problems.
		Apply Inverse Laplace Transforms to solve Engineering problems.
		Demonstrate the Fourier series & apply it in Engineering problems.
		Analyze & solve complex Engineering Problems.
		Apply Z-transform and inverse Z-transform to change the input signals in Engineering problems.
		Apply the concept of Correlation and Regression to the engineering problems.
2	Digital Logic Design and Analysis (CSC302)	Explain different number systems and their conversions.
		Analyze and minimize Boolean expressions.
		Design and analyze combinational circuits.
		Design and analyze sequential circuits.
		Describe the basic concepts of VHDL.
		Explain basics of TTL and CMOS Logic families.
3	Discrete Mathematics (CSC303)	Find the notion of mathematical thinking, mathematical proofs and apply them in problem solving.
		Examine relations, Diagraph and lattice.
		List functions, graphs and their use in programming applications.
		Explain groups and codes in Encoding-Decoding.
		Explain groups able to express a logic sentence in terms of predicates.
		Apply discrete structures in other computing problems such as formal specification, verification, artificial intelligence, crypgraphy, Data Analysis and Data Mining etc.
4	Electronic Circuits and Communication Fundamentals (CSC304)	Analyze the use of semiconductor devices in circuits.
		Analyze importance of oscillars and power amplifiers in communication system.
		Explain basic concepts of operational amplifier and their applications.
		Analyze the fundamental concepts of electronic communication.
		Analyze electronic devices and circuitsused in communication applications.
		Identify basic concepts of information theory.
5	Data Structure (CSC305)	Demontrate difference between data structures.
		Define linear and non-linear data structures like stacks, linked list etc.
		Construct the programs using link list, choose appropriate data structure as applied specified problem definition.
		Develop a code using linked list and form the tree data structure
		Apply operations like traversing mechanism etc. on Various data structures.
		Apply operations like searching, sorting, insertion, deletion, traversing.

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## DEPARTMENT OF COMPUTER ENGINEERING

ACADEMIC YEAR 2018-19

YEAR: SE

SEM: IV

SCHEME:CBCS

## COURSE OUTCOMES

On successful completion of course learner will be able to

SR.NO.	SUBJECT	COURSE OUTCOMES
1	Applied Mathematics-IV (CSC401)	Apply the method of solving complex integration, computing residues & evaluate various contour integrals.
		Demonstrate the matrices and compute Eigen values and Eigen vectors.
		Apply the concept of probability distribution to the engineering problems.
		Apply the concept of large sampling theory to the engineering problems.
		Apply the concept of small sampling theory to the engineering problems.
		Apply the concept of Linear & Non-Linear Programming Problem to the engineering problems.
2	Analysis of Algorithms(CSC402)	Analyze the running time and space complexity of algorithms.
		Analyze the complexity of divide and conquer strategy.
		Analyze the complexity of greedy strategy.
		Demonstrate the complexity of dynamic programming strategy.
		Demonstrate backtracking, branch, bound ,string matching techniques.
		Analyze P,NP, and NP-Complete certain problem is NP-Complete.
3	Computer Organization and Architecture(CSC403)	Explain basic structure of the Compiler system.
		Analyze the arithmetic algorithms for solving ALU operations
		Explain instruction level parallelism and hazards in typical processor pipelines.
		Explain superscalar architectures, multi-core architecture and their advantages.
		Demonstrate the memory mapping techniques.
		Identify various types of interrupts and I/O operations in a Compiler system.
4	Computer Graphics(CSC404)	Demonstrate and Analyze the basic concepts of Computer Graphics.
		Demonstrate various algorithms for scan conversion and filling of basic objects and their comparative analysis.
		Determine the three Dimensional Object Representations.
		Apply geometric transformations, viewing and clipping on graphical objects.
		Explore solid model representation techniques and projections.
		Analyze visible surface detection techniques.
5	Operating System(CSC405)	Analyze role of Operating System in terms of process, memory, file and I/O management.
		Analyze the concept of a process, thread, mutual exclusion and deadlock.
		Evaluate performance of process scheduling algorithms and IPC.
		Analyze the concepts of memory management techniques.
		Evaluate the performance of memory allocation and replacement techniques.
		Analyze the different techniques of file and I/O management.

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ACADEMIC YEAR 2018-19

YEAR: SE

SEM: IV

SCHEME:CBCS

## COURSE OUTCOMES

On successful completion of course learner will be able to

SR.NO.	SUBJECT	COURSE OUTCOMES
6	Analysis of Algorithms Lab(CSL401)	Analyze the complexities of various problems in different domains.
		Analyze running time of basic algorithms for classic problems in various domains.
		Develop the efficient algorithms for new problems with suitable designing techniques.
		Improve the algorithms using different strategies.
7	Computer Graphics Lab(CSL402)	Explore the working principle, utility of various input/ output devices.
		Improve various output and filled area primitive algorithms using C.
		Apply transformation and clipping algorithms on graphical objects.
		Construct the curve and fractal generation.
		Develop a Graphical application based on learned concept.
8	Processor Architecture Lab(CSL403)	Analyze to Assemble personal Compiler.
		Design basic building blocks of a Compiler.
		Improve various algorithms like Booth's algorithm for arithmetic operations.
		Explain various I/O Builds with merits and demerits
9	Operating System Lab(CSL404)	Analyze basic operating system commands.
		Analyze and explore various system calls.
		Compile shell scripts and shell commands using kernel APIs.
		Improve and analyze different process scheduling algorithms
		Improve and analyze different memory management algorithms.
		Evaluate process management techniques and deadlock handling using simulator.
10	Open Source Technology Lab(CSL405)	Analyze basic concepts in python and perl.
		Explore contents of files, directories and text processing with python.
		Develop program for data structure using built in functions in python.
		Explore django web framework for developing python based web application.
		Analyze file handling and database handling using perl.
		Explore basics of two way communication between client and server using python and perl.

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## DEPARTMENT OF COMPUTER ENGINEERING

ACADEMIC YEAR 2018-19

YEAR: TE

SEM:V

SCHEME:CBCS

## COURSE OUTCOMES

On successful completion of course learner will be able to

SR.NO.	SUBJECT	COURSE OUTCOMES
1	Microprocessor (CSC501)	Analyze microprocessors and Intel 8086/8088 Architecture.
		Demonstrate the programs to run on 8086 microprocessor systems.
		Design system using memory chips and peripheral chips for 16 bit 8086microprocessor
		Analyze techniques for faster execution of instructions, improve speed of operations and enhance performance of microprocessors.
		Distinguish between RISC and CISC processors.
		Analyze multi core processor and its advantages.
2	Database Management System(CSC502)	Analyze the fundamentals of a database systems.
		Design and draw ER and EER diagram for the real life problem.
		Analyze the conceptual model relational model and formulate relational algebra queries.
		Design and querying database using SQL.
		Analyze and apply concepts of normalization relational database design.
		Analyze concept of transaction, concurrency and recovery.
3	Computer Network(CSC503)	Analyze concepts and fundamentals of data communication and computer networks.
		Explore the inter-working of various layers of OSI.
		Analyze the issues and challenges of protocols design while developing in TCP/IP protocol suite.
		Demonstrate the strengths and weaknesses of various routing algorithms.
		Analyze transport layer and various application layer protocols.
		Demonstrate Network Layer with switching and routing technologies.
4	Theory of Computer Science(CSC504)	Identify the central concepts in theory of computation and Simplify between deterministic and nondeterministic automata, also obtain equivalence of NFA and DFA.
		Design the equivalence of languages Explained by finite automata and regular expressions.
		Demonstrate regular, context free grammars while recognizing the strings and tokens.
		Design pushdown automata recognize the language.
		Develop an Analyzing of computation through Turing Machine.
		Analyze fundamental Analyzing of decidability and undecidability.
5	Advanced Operating Systems (CSDLO5012)	Demonstrate Analyzing of design issues of Advanced operating systems.
		Classify different types of operating systems.
		Analyze the design aspects and data structures for file subsystem, memory subsystem.
		Demonstrate process subsystem of Unix OS.
		Demonstrate different architectures of Multiprocessor OS.
		Design data structures in Multiprocessor operating systems.
6	Microprocessor Lab(CSL501)	Build appropriate instructions program in microprocessor to perform various tasks.
		Develop the program in assembly language for Intel 8086 processor.
		Demonstrate the execution and debugging of assembly language program.



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## DEPARTMENT OF COMPUTER ENGINEERING

ACADEMIC YEAR 2018-19

YEAR: TE

SEM:V

SCHEME:CBCS

## COURSE OUTCOMES

On successful completion of course learner will be able to

SR.NO.	SUBJECT	COURSE OUTCOMES
7	Computer Network Lab (CSL502)	Design and setup networking environment in Linux.
		Build Network OS mulars such as NS2, Wireshark
		Improve programs using core programming APIs for Analyzeing networking concepts.
8	Database & Information System Lab (CSL503)	Design and draw ER and EER diagram for the real life problem with software ol.
		Create and update database and tables with different DDL and DML statements.
		Apply integrity constraints and able to provide security data.
		Improve and execute Complex queries.
		Apply triggers and procedures for specific modules.
		Utilize concurrent transactions and able to access data through front end (using JDBC ODBC Connectivity).
9	Web Design Lab (CSL504)	Analyze the core concepts and features of Web Technology.
		Design static web pages using HTML5 and CSS3.
		Apply the concept of client side validation and design dynamic web pages using JavaScript.
		Evaluate client and server side technologies and create Interactive web pages using PHP , AJAX with database connectivity using MySQL.
		Analyze the basics of XML, DTD and XSL and develop web pages using XML / XSLT.
		Analyze end Buildr requirements and Create web application using appropriate web technologies and web development framework.
10	Business Communication & Ethics (CSL505)	Design a technical document using precise language, suitable vocabulary and apt style.
		Develop the life skills/interpersonal skills progress professionally by building stronger.
		Demonstrate awareness of contemporary issues knowledge of professional and ethical.
		Apply the traits of a suitable candidate for a job/higher education.
		Apply techniques of holding a group discussion, facing interviews and writing resume/SOP.
		Select formal presentations effectively Improveing the verbal and non-verbal skills

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## DEPARTMENT OF COMPUTER ENGINEERING

ACADEMIC YEAR 2018-19

YEAR: TE

SEM: VI

SCHEME:CBCS

## COURSE OUTCOMES

On successful completion of course learner will be able to

SR.NO.	SUBJECT	COURSE OUTCOMES
1	Software Engineering(CSC601)	Analyze and demonstrate basic knowledge in software engineering.
		Identify requirements, analyze and prepare models.
		Plan, schedule and track the progress of the projects.
		Design & develop the software projects.
		Identify risks, manage the change assure quality in software projects.
		Apply testing principles on software project and Analyze the maintenance concepts.
2	System Programming and Compiler Construction(CSC602)	Identify the relevance of different system programs.
		Explain the various data structures and passes of assembler design.
		Identify the need for different features and designing of macros.
		Classify different loaders and linkers and their contribution in developing efficient Buildr application
		Construct different parsers for given context free grammars.
		Identify the need synthesis phase produce object code optimized in terms of high execution speed and less memory usage
3	Data Warehousing & Mining(CSC603)	Analyze Data WarehoBuild fundamentals, Data Mining Principles
		Design data warehoBuild with dimensional modelling and apply OLAP operations.
		Identify appropriate data mining algorithms solve real world problems
		Compare and evaluate different data mining techniques like classification, prediction, clustering and association rule mining
		Explain complex data types with respect spatial and web mining.
		Demonstrate Buildr experiences wards research and innovation.
4	Cryptography and System Security(CSC604)	Analyze system security goals and concepts, classical encryption techniques.
		Analyze encryption and decryption techniques verifying the integrity of varying message sizes.
		Apply the knowledge of cryptographic checksums and evaluate the performance of different message digest algorithms for verifying the integrity of varying message sizes.
		Apply different digital signature algorithms achieve authentication and design secure applications.
		Explore and analyze sniffers, port scanners and other related ols for analysing packets in a network.
		Analyze confidentiality ,authentication and design secure applications.
5	Advanced Computer Network(CSDLO6024)	Demonstrate the Analyzeing of advance data communication technologies.
		Demonstrate the Analyzeing of WAN Technology typically ATM .
		Demonstrate the Analyzeing of packet switching procols such as X.25, X.75.
		Explore the issues of advance internet routing procols and also QoS based procols.
		Analyze issues of traffic requirements and perform capacity planning.
		Demonstrate the Analyzeing of procol Buildd for management of network
6	Software Engineering Lab (CSL601)	Identify requirements and apply process model selected case study.
		Analyze and design models for the selected case study using UML modeling.
		Analyze the use of various software engineering ols

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## DEPARTMENT OF COMPUTER ENGINEERING

ACADEMIC YEAR 2018-19

YEAR: TE

SEM: VI

SCHEME:CBCS

## COURSE OUTCOMES

On successful completion of course learner will be able to

SR.NO.	SUBJECT	COURSE OUTCOMES
7	System Software Lab(CSL602)	Apply machine code by using various databases generated in pass one of two pass assembler.
		Construct different databases of single pass macro processor.
		Identify and validate different tokens for given high level language code.
		Apply input string by constructing p down /Botm up parser.
		Improve synthesis phase of compiler with code optimization techniques.
		Apply various ols like LEX and YACC.
8	Data warehousing & Mining(CSC603)	Design data warehoBuild and perform various OLAP operations.
		Improve classification, prediction, clustering and association rule mining algorithms.
		Demonstrate classifications, prediction, clustering and association rule mining algorithms on a given set of data sample using data mining ols.
		Demonstrate spatial and web mining algorithms.
9	System Security Lab(CSL604)	Apply the knowledge of symmetric crygraphy Improve simple ciphers.
		Apply analyze and Improve public key algorithms like RSA and El Gamal.
		Analyze and evaluate performance of hashing algorithms.
		Explore the different network reconnaissance ols gather information about networks.
		Demonstrate firewalls and intrusion detection systems using open source technologies and explore email security.
		Explore various attacks like buffer-overflow, and web-application attacks.

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## DEPARTMENT OF COMPUTER ENGINEERING

ACADEMIC YEAR 2018-19

YEAR: BE

SEM: VII

SCHEME:CBGS

## COURSE OUTCOMES

On successful completion of course learner will be able to

SR.NO.	SUBJECT	COURSE OUTCOMES
1	Digital Signal Processing(CPC701)	Analyze the concept of DT Signal and perform signal manipulation.
		Analyze the DT Systems and find analysis of system in time domain.
		Analyze Fourier Transform System in frequency domain.
		Explain FFT algorithm and design the same.
		Develop different DSP Algorithms.
		Analyze and Simplify Digital Signal Processor and Microprocessor working.
2	Cryptography And System Security(CPC702)	Analyze Compiler security, the principles and techniques of cryptography.
		Analyze Data Encryption Standard(DES), Learned principles of Public Key Cryptography.
		Analyze Hash Functions, secure hash algorithm.
		Demonstrate the Authentication Applications.
		Explain the Program , Operating System, Database Security and working of IDS and Firewalls.
		Analyze IP Security.
3	Artificial Intelligence(CPC703)	Develop a basic Analyzing of AI.
		Develop a basic Analyzing of AI building blocks presented in intelligent agents.
		Select the appropriate problem solving method and knowledge representation technique.
		Explain strength and weaknesses of AI approaches knowledge- intensive problem solving.
		Design models for reasoning with uncertainty as well as the Build of unreliable information.
		Design and develop the AI applications in real world scenario.
4	Image Processing (ELEC - II)(CPE7023)	Analyze image formation and the role human visual system plays in perception of gray and color image data.
		Solve the image processing algorithms and techniques in image enhancement.
		Analyze different operations and algorithm in image segmentation and image representations.
		Develop fast image transform flow graph.
		Analyze different image compression techniques to reduce data transmission cost.
		Construct Binary Image Processing Operations and extract important features from an image.
5	Network Threats and Attacks Laboratory(CPL701)	Analyze and Use various network reconnaissance tools.
		Analyze the use of Nessus tool to scan network for vulnerabilities.
		Construct the code to simulate buffer overflow attack.
		Demonstrate the Set up IPSEC under LINUX.
		Analyze and Install IDS study logs.
		Demonstrate the NMAP installation and scan different ports.

## SHIVAJIRAO S. JONDHLE COLLEGE OF ENGINEERING &amp; TECHNOLOGY, ASANGAON

NAAC Accredited B++

## DEPARTMENT OF COMPUTER ENGINEERING

ACADEMIC YEAR 2018-19

YEAR: BE

SEM: VIII

SCHEME:CBGS

## COURSE OUTCOMES

On successful completion of course learner will be able to

SR.NO.	SUBJECT	COURSE OUTCOMES
1	Data Warehousing & mining(CPC801)	Demonstrate Data Warehousing ,Role of Metadata,Data Warehousing Design Strategies, Design Model.
		Apply various concept related with Data Cleaning like Extraction ,loading and Transform.
		Compare the various Data Mining Technique, Statistical Description of Data & Data Visualization.
		Explain and analyze the pre-processing Normalization, Binning, Hisgram.
		Explain and analyze the pre-processing Normalization, Binning, Hisgram.
		Demonstrate the Mining Frequent Pattern and Association Rule.
2	Human Machine Interaction(CPC802)	Analyze the psychology of humans for interaction with machines.
		Analyze and design for different experience of levels of Builders.
		Analyze make design of graphics for making GUI and Web UI.
		Analyze make good design for GUI and Web UI considering designing guidelines.
		Design good design using interaction styles.
		Analyze and design good communication style using Text messages.
3	Parallel and Distributed Computing(CPC803)	Demonstrate Parallel Programming Models, Parallel Algorithms and Pipeline Processing.
		Analyze SIMD parallel Processors.
		Classify distributed systems, Distributed System Model.
		Analyze and Improve the RPC.
		Improve different types of scheduling and synchronization algorithm and compare them.
		Analyze hadoop system.
4	Digital Forensics (ELEC-III)(CPE8034)	Analyze the concept of Cybercrime.
		Analyze digital forensics data duplication ols requirement.
		Analyze Preserving and recovering of digital evidences.
		Analyze different attacks on a network.
		Analyze Data analysis Techniques.
		Classify laws concerned with digital forensics and cybercrime.
5	Cloud Computing Laboratory(CPL801)	Analyze and running virtual machines on open source OS.
		Analyze the concept of SaaS and implement using own Cloud.
		Analyze identity management in cloud and simulate it by using OpenStack.
		Analyze how to secure web server and own cloud.
		Analyze how to create and manage various users accounts.
		Analyze Microsoft Azure with types.

## SHIVAJIRAO S. JONDHLE COLLEGE OF ENGINEERING &amp; TECHNOLOGY, ASANGAON

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## DEPARTMENT OF ELECTRONICS AND TELECOMMUNICATION ENGINEERING

ACADEMIC YEAR 2018-19

YEAR: SE

SEM: III

SCHEME:CBCS

## COURSE OUTCOMES

After Successful completion of course student will be able to

SR.NO	SUBJECT	COURSE OUTCOMES
1	AAPPLIED MATHMATICS-III (ECC301)	Apply Laplace Transforms to solve Electronics & Telecommunication Engineering problems.
		Apply Inverse Laplace Transforms to solve Electronics & Telecommunication Engineering problems.
		Construct Fourier series & apply it in Telecommunication Engineering.
		Evaluate area & volume & identify & model the problems in the field of Electronics & Telecom Engineering & solve it.
		Evaluate area & volume & identify & model the problems in the field of Electronics & Telecom Engineering & solve it.
		Select and solve complex Engineering Problems.
2	ELECTRONIC DEVICES AND CIRCUITS-I (ECC302)	Outline the Active and Passive Elements, Diode
		Design of Rectifiers, Filters & Regulator
		Define operation of BJT, FET & Analyze BJT, FET
		Analyze Small Signal analysis, Transistor Modeling
		Evaluate the high frequency response of BJT and FET
		Design single stage Amplifier.
3	DIGITAL SYSTEM AND DESIGN (ECC303)	Develop a digital logic and apply it to solve real life problems.
		Analyze, design and implement combinational logic circuits.
		Classify different semiconductor memories.
		Analyze, design and implement sequential logic circuits.
		Analyze digital system design using PLD.
		Construct and simulate combinational and sequential circuits using VHDL systems.
4	CIRCUIT THEORY AND NETWORKS (ECC304)	Analyze circuits by using network theorems
		Analyze and evaluate network topologies for a circuit
		Analysis of time and frequency domain with different methods
		Analysis of circuit network functions
		Determine various parameters of two port network
		Design the circuit network
5	ELECTRONIC INSTRUMENTS AND CONTROL (ECC305)	Discuss basic Concept of Instruments and Measure various parameters.
		Explain Principle of operations for various Sensors and Transducers.
		Describe functional blocks of data acquisition system and Telemetry.
		Determine transfer functions for given systems.
		Evaluate time domain parameter for given system and Predict its Stability using appropriate Criteria.
		Evaluate frequency domain parameter for given system and Predict its Stability using appropriate Criteria.
6	ELECTRONIC DEVICES AND CIRCUIT-I LAB (ECL301)	Discuss different type of measuring instrument.
		Construct and simulate characteristic of PN junction diode and its application.
		Find stability of CE-BJT amplifier.
		Analyze and design characteristic of CE-BJT amplifier
		Analyze and design characteristic of FET amplifier
		Analyze and design frequency response of FET amplifier
7	DIGITAL SYSTEM AND DESIGN LAB (ECL302)	Illustrate Truth Table and implement different basic Gates.
		Solve the given Boolean function using logic gates in both SOP and POS.
		Create sequential logic circuits
		Create combinational logic circuits
		Design & analyze 4-bit Binary to gray code converter/ 4-bit Gray to Binary code converter.
8	OOP USING JAVA LAB (ECL303)	Explain the fundamental concepts of Object Oriented Programming
		Explain the Fundamental of Java Programming
		Apply Methods, Constructors, Destructors and Arrays
		Analyze Inheritance, Interface and Package
		Compose program using Multithreading and applet

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**DEPARTMENT OF ELECTRONICS AND TELECOMMUNICATION ENGINEERING**

ACADEMIC YEAR 2018-19

YEAR: SE

SEM: IV

SCHEME:CBCS

**COURSE OUTCOMES**

After Successful completion of course student will be able to

SR.NO	SUBJECT	COURSE OUTCOMES
1	APPLIED MATHEMATICS -IV (ECC401)	Demonstrate the Basic knowledge of calculus of variation
		Demonstrate the knowledge of vector spaces, subspaces, orthogonal spaces & Gramschmidt process.
		Apply the Knowledge of Eigen values & Eigen vectors to various problems in the field of Image Processing.
		Demonstrate an ability to identify & solve problems on Probability Distribution.
		Solve problems on correlation & find equations of lines of Regression.
2	ELECTRONIC DEVICES AND CIRCUITS-II (ECC402)	Apply the concept of line Integral & Residue Theorem to evaluate Integrals of different types.
		Explain the Construction, operation and characteristics of MOSFET and MOSFET biasing.
		Analyze the multistage amplifiers with different coupling methods.
		Design the Multistage amplifiers (CE-CE, CS-CS, CS-CE).
		Classify the power amplifiers and Design the power amplifiers.
3	LINEAR INTEGRATED CIRCUITS (ECC- 403)	Analyze the different feedback topologies.
		Explain and Design the different oscillator circuits.
		Explain the various current mirror circuits and analyze differential amplifier with active load
		Discuss the linear application of operational amplifier
		Discuss the non-linear application of operational amplifier
4	SIGNALS AND SYSTEMS (ECC404)	Explain analog to digital and digital to analog converter
		Discuss function and applications of special function Ics.
		Discuss function and applications of voltage regulators.
		Discuss about various types of signals and systems, classify them, analyze them, and perform various operations on them,
		Explain use of transforms in analysis of signals and system in continuous and discrete time domain.
5	PRINCIPLES OF COMMUNICATION ENGINEERING (ECC405)	Examine the effect of various properties and operations of signals and systems.
		Evaluate the time and frequency response of Continuous and Discrete time systems which are useful to understand the behaviour of electronic circuits and communication systems.
		Apply the knowledge of state variable in time domain.
		Apply the knowledge of signal and system.
		Outline the basics of communication system.
6	ELECTRONIC DEVICES AND CIRCUITS-II LAB (ECL401)	Apply different modulation and demodulation techniques used in analog communication
		Identify and solve basic communication problems
		Analyze different types of transmitter and receiver circuits
		Compare and contrast design issues, advantages, disadvantages and limitations of analog communication systems
		Explain the concept of multiplexing technique.
7	LINEAR INTEGRATED CIRCUITS LAB (ECL-402)	Analyze and design different amplifier to observe their frequency response.
		Determine and verify frequency of oscillation of different oscillators.
		Construct and explain different power amplifier with their efficiency.
		Design, implement, and demonstrate basic electronic analog circuit.
8	PRINCIPLES OF COMMUNICATION ENGINEERING LAB (ECL403)	Demonstrate and calculate linear and non linear application of OP-AMP
		Demonstrate basic Amplifier Circuit using OP-AMP
		Make Use of P-spice model for designing different linear circuit.
		Demonstrate different type of Modulation and Demodulation
8	PRINCIPLES OF COMMUNICATION ENGINEERING LAB (ECL403)	Demonstrate different type of Pulse Modulation and Demodulation
		Demonstrate different type Multiplexing techniques
		Make use of MATLAB to illustrate different types of Modulation.

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**DEPARTMENT OF ELECTRONICS AND TELECOMMUNICATION ENGINEERING**

**ACADEMIC YEAR 2018-19**

**YEAR: TE**

**SEM: V**

**SCHEME:CBCS**

**COURSE OUTCOMES**

**After Successful completion of course student will be able to**

SR.NO	SUBJECT	COURSE OUTCOMES
1	MICROPROCESSOR AND PERIPHERALS INTERFACING (ECC501)	Explain the basic concepts of microcomputer systems
		Explain the architecture and discuss software aspects of microprocessor 8086
		Compose Assembly language program in 8086
		Design 8086 systems to interface various peripherals and apply it for a task
		Design 8086 systems to interface ADC & DAC and apply it for a task
2	DIGITAL COMMUNICATION (ECC502)	Design elementary aspect of microprocessor based system
		Explain random variable and random process of signal.
		Apply the concept of Information theory in source coding.
		Evaluate performance of different error control codes.
		Compare different band-pass modulation techniques.
3	ELECTROMAGNETIC ENGINEERING (ECC503)	Evaluate different method to eliminate Inter-symbol interference.
		Explain optimum reception of digital signal.
		Discuss electromagnetics, including static and dynamic electromagnetic fields.
		Explain and analyse the knowledge of Electric Field In Material Space.
		Explain Steady Magnetic Field on the basis of various laws.
4	DISCRETE TIME SIGNAL PROCESSING (ECC504)	Analyse Maxwell's equations and explain electromagnetic wave propagation.
		Analyse transmission line parameters and calculate them using smith chart.
		Explain applications of electromagnetics.
		Explain the concepts of discrete-time Fourier transform and fast Fourier transform.
		Apply the knowledge of design of IIR digital filters to meet arbitrary specifications.
5	TV AND VIDEO ENGINEERING (ECCDLO 5012)	Apply the knowledge of design of FIR digital filters to meet arbitrary specifications.
		Analyze the effect of hardware limitations on performance of digital filters.
		Apply the knowledge of DSP processors for various applications.
		Explain types of picture tubes ,scanning & Transmission & Reception of signals
		Classify Colour Television system characteristics and different types of encoding systems
6	MICROPROCESSOR AND PERIPHERALS INTERFACING LAB (ECL501)	Explain Basics of digital video formats and there comparison
		Explain types Digital Video Broadcasting
		Explain Advanced Digital Smart TV ,IP TV and its applications
		Discuss LCD LED and Chromcast TV
		Discuss and draw architecture of microprocessor.
7	DIGITAL COMMUNICATION LAB (ECL502)	Compile different tasks on microprocessor 8086 by using debug.
		Design the interface of peripheral with 8086.
		Illustrate and verify sampling theorem.
		Illustrate various line code using MATLAB.
		Analyze bandpass modulation and demodulation technique using MATLAB.
8	BUSINESS COMMUNICATION AND ETHICS LAB (ECL503)	Analyze different error correcting codes by using MATLAB.
		Discuss buisness and professional writing skill
		Interpret technical proposal at buisness level.
		Apply interpersonal skill like leadership, team building and management proficiency.
		Illustrate ethical code of conduct in buisness and corparate activities.
9	OPEN SOURCE TECHNOLOGY FOR COMMUNJICATION LAB (ECL504)	Illustrate employment skill like presentaiton skill, interview technique and group discussion.
		Demonstrate Installation of Scilab and LT Spice
		Make use of SCILAB to perform different operations on signals..
		Design modulation waveform using Scilab
		Design different analog circuits LTSpice
10	TV AND VIDEO ENGINEERING LAB (ECCDLO 5012)	Demonstrate and test sound section of monochrome (b/w) television
		Demonstrate different layers of lcd display and led display
		Test and modify receiving frequency of dth receiver
		Test and demonstrate settings of set top box
		Design and test basic remote control circuit and lvds cable for lcd panel.



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## DEPARTMENT OF ELECTRONICS AND TELECOMMUNICATION ENGINEERING

ACADEMIC YEAR 2018-19

YEAR: TE

SEM: VI

SCHEME:CBCS

## COURSE OUTCOMES

After Successful completion of course student will be able to

SR.NO	SUBJECT	COURSE OUTCOMES
1	MICROCONTROLLERS & APPLICATIONS (ECC601)	Discuss in detail architecture of 8051.
		Explain working of the microcontroller 8051 in depth and their instruction set & programming
		Design microcontroller 8051 system for interfacing various peripheral devices
		Discuss architecture of ARM 7 microcontroller.
		Explain working of ARM 7 microcontroller and their instruction set and compose program.
2	COMPUTER COMMUNICATION NETWORKS (ECC602)	Compose Assembly language and Embedded C program for microcontrollers
		Design a small or medium sized computer network including media types, end devices, and interconnecting devices that meets a customer's specific needs
		Apply the basic configurations on routers and Ethernet switches.
		Demonstrate knowledge of programming for network communications.
		Create computer networks and analyse the simulation results.
		Identify the connectivity problems in a host occurring at multiple layers of the OSI model.
3	ANTENNA AND RADIO WAVE PROPAGATION (ECC603)	Develop knowledge and skills necessary to gain employment as computer network engineer and network administrator.
		Define basic antenna parameters like radiation pattern, directivity and gain.
		Determine the field equations for the basic radiating elements like wire antenna and loop antenna.
		Analyze and design of uniform linear and planar arrays
		Discuss and analysis of aperture antennas.
4	IMAGE PROCESSING AND MACHINE VISION (ECC604)	Analyze and apply microstrip antennas
		Analysis of antenna measurements & wave propagation.
		Explain the fundamentals of digital image processing and its color image models.
		Discuss the need for image transforms, types and their properties.
		Classify different techniques employed for the enhancement of images both in spatial and frequency domain.
		Examine image morphology & restoration techniques and methods.
5	DIGITAL VLSI DESIGN (ECCDLO6021)	Discuss need of image segmentation for feature extraction.
		Discuss the basics of boundary description and object recognition.
		Explain the semiconductor technology, scaling and performance
		Analyze logic circuits with different design styles.
6	MICROCONTROLLER & APPLICATIONS LAB (ECL601)	Explain the operation of memory, storage circuits and data path elements
		Explain VLSI clocking style & I/O Circuit
7	COMPUTER COMMUNICATION NETWORKS LAB (ECL602)	Make use of SPJ Simulator to perform different tasks on 8051 microcontroller.
		Make use of MPLAB & Proteus for Microcontroller 8051 Interfacing
8	ANTENNA AND RADIO WAVE PROPAGATION LAB (ECL603)	Discuss network tools and their configuration.
		Construct the configuration of various network devices
		Design the network topology and services eg. Telnet, FTP
9	IMAGE PROCESSING AND MACHINE VISION LAB (ECL604)	Analyze the topology in NS-2 and configuration of WSN nodes with TCP and UDP
		Classify different antenna parameters.
		Make use of MATLAB software for different types of antenna
10	DIGITAL VLSI DESIGN LAB (ECLDLO6021)	Make a use of MATLAB to perform different techniques of image processing.
		Demonstrate Image Processing for boundary description
		Analyze object recognition using MATLAB
10	DIGITAL VLSI DESIGN LAB (ECLDLO6021)	Discuss the semiconductor technology, scaling and performance
		Analyze logic circuits with different design styles.
		Explain the operation of memory, storage circuits and data path elements
		Explain VLSI clocking style & I/O Circuit

**SHIVAJIRAO S. JONDHLE COLLEGE OF ENGINEERING & TECHNOLOGY, ASANGAON**  
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**DEPARTMENT OF ELECTRONICS AND TELECOMMUNICATION ENGINEERING**  
**ACADEMIC YEAR 2018-19**

YEAR: BE

SEM: VII

SCHEME:CBGS

**COURSE OUTCOMES****After Successful completion of course student will be able to**

SR.NO	SUBJECT	COURSE OUTCOMES
1	IMAGE AND VIDEO PROCESSING (ETC701)	Explain the fundamentals of digital image processing and its color image models.
		Analyze the need for image transforms, types and their properties.
		Classify different techniques employed for the enhancement of images both in spatial and frequency domain.
		Discuss need of image segmentation for feature extraction.
		Examine image restoration techniques and methods.
		Outline the basics of video processing.
		Demonstrate quantitative models for engineering applications in video processing.
2	MOBILE COMMUNICATION (ETC702)	Define the infrastructure for development in mobile communication systems
		Classify different standards & aspects of 2G Technologies
		List different standards & aspects of 3G Technologies.
		Discuss Structure of Long Term Evolution Technique.
		Explain emerging technologies required for 4G,SDR, & MIMO
3	OPTICAL COMMUNICATION AND NETWORKS (ETC703)	Discuss different fundamentals of propagation models
		Define the fundamental principles of optics and light wave to design optical fiber communication systems
		Discuss transmission characteristics of optical fiber communication.
		Design optical fiber communication link using appropriate optical fiber, light sources & photo detectors.
		Explain Optical Network System Components and Optical Networks.
4	MICROWAVE AND RADAR ENGINEERING (ETC704)	Illustrate the concepts of designing and operating principles of modern optical communication systems and networks
		Explain optical Network Design and Management
		Distinguish and identify waveguides and microwave components
		Develop impedance matching and tuning network
		Explain generation and amplification of microwaves
		Identify semiconductor devices
5	DATA COMPRESSION AND ENCRYPTION (ETE701)	Discuss RADAR for industrial and scientific purpose
		Categorized microwave applications
		Explain Text compression and illustrate compression techniques.
		Discuss Audio compression.
		Discuss image and video compression.
6	DATA COMPRESSION AND ENCRYPTION LAB (ETEL701)	Explain and illustrate types of cipher.
		Discuss symmetric and asymmetric key cryptography schemes.
		Discuss network security and ethical hacking.
		Illustrate different data compression technique using MATLAB software.
		Classify different audio compression technique.
7	IMAGE AND VIDEO PROCESSING LAB (ETL701)	Classify different image compression.
		Illustrate image compression using DCT using MATLAB.
		Illustrate different data encryption technique using MATLAB.
8	ADVANCE COMMUNICATION ENGINEERING LAB-I (ETL702)	Analyze and explain digital image processing
		Make use of MATLAB to perform different techniques of image processing.
9	ADVANCE COMMUNICATION ENGINEERING LAB-II (ETL703)	Demonstrate image processing using DSP hardware
		Make Use of AT commands of MHT software to perform different task on MHT hardware
		Make Use of NS2 software to simulate different communication network
		Measures Frequencies of different devices using RADAR
		Demonstrate different microwave components using test bench
		Design and apply analog and digital link using optical fiber

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**DEPARTMENT OF ELECTRONICS AND TELECOMMUNICATION ENGINEERING**

**ACADEMIC YEAR 2018-19**

**YEAR: BE**

**SEM: VIII**

**SCHEME:CBGS**

**COURSE OUTCOMES**

**After Successful completion of course student will be able to**

SR.NO	SUBJECT	COURSE OUTCOMES
1	WIRELESS NETWORKS (ETC801)	Discuss GSM , UMTS , HSPA and LTE
		Estimate Link budgets for GSM, CDMA, CDMA2000, HSDPA systems ,RF planning
		List different standards & aspects of Emerging Wireless Technologies.
		Discuss Wireless Sensor Network, Applications of wireless sensor network ,Medium access control protocols, routing protocols, transport control protocols
		Explain Middleware for Sensor Networks & Network Management
2	SATELLITE COMMUNICATION & NETWORKS (ETC802)	Explain the basics of satellite communication
		Analyze and design satellites as per various conditions of space
		Explain and analyzes link budget of satellite signal for proper communication
		Apply the system for the benefit of society
		Analyze various coding techniques for the transformation of signals.
		Discuss the different application of satellite communication
3	INTERNET & VOICE COMMUNICATION ( ETC803)	Explain the concept of encapsulation and its relationship to layering in the network models.
		Discuss the operation of the components of a router including, DHCP, Routing function, Switching function and DNS in the global internet.
		Explain how TCP's byte-stream sliding window is related to a traditional packet-based sliding window algorithm.
		Construct local area networks using both static and dynamic addressing techniques including sub netting.
		Explain Audio and Video digitization and its compression techniques.
Discuss and analyze the issues in providing quality-of-service for networked multimedia applications, such as internet telephony.		
4	TELECOM NETWORK MANAGEMENT (ETE802)	Outline the overview of Network management with all Perspectives.
		Explain OSI network management standards & models
		Explain about the SNMP models with proxy server and RMON
		Illustrate the concepts of Broadband Network Management & ATM Technology.
		Apply the Network Management application to different models in the system.
		Define Telecommunication Management Networks with conceptual model, standard and architecture.
5	WIRELESS NETWORKS LAB (ETL801)	Make use of NS-2 software to simulate wireless networks.
		Analyze and design wireless network.
		Design and analyze link budget of GSM and CDMA.
6	SATELLITE COMMUNICATION & NETWORKS LAB (ETL802)	Analyze and measure different signal of satellite communication.
		Analyze and Measure different parameter of satellite link budget.
		Make Use of STK and Celestia software for domestic and space satellite system.
7	TELECOM NETWORK MANAGEMENT LAB (ETEL802)	Make Use of CISCO packet tracer for analyzing different network topologies and OSI model.
		Design of different protocols and network using CISCO packet tracer.
		Make Use of wireshark for analyzing different protocol
8	INTERNET & VOICE COMMUNICATION LAB ( ETL803)	Use of CISCO packet tracer to design different protocol of application layer.
		Analyze different function of TCP-IP layer.
		Use of Ubuntu Linux for multimedia handling.

**SHIVAJIRAO S. JONDHLE COLLEGE OF ENGINEERING & TECHNOLOGY, ASANGAON**

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**DEPARTMENT OF MECHANICAL ENGINEERING**

ACADEMIC YEAR 2018-19

**YEAR: SE****SEM: III****SCHEME:CBCS****COURSE OUTCOMES****Learner will be able to**

SR.NO	SUBJECT	COURSE OUTCOMES
1	Applied Mathematics III (MEC301)	Demonstrate the ability of using Laplace Transform in solving the Ordinary Differential Equations and Partial Differential Equations.
		Demonstrate the ability of using Fourier Series in solving the Ordinary Differential Equations and Partial Differential Equations.
		Solve initial and boundary value problems involving ordinary differential equations.
		Identify the analytic function, harmonic function, orthogonal trajectories.
		Apply bilinear transformations and conformal mappings.
		Identify the applicability of theorems and evaluate the contour integrals.
2	Thermodynamics (MEC302)	Demonstrate application of the laws of thermodynamics to wide range of systems.
		Solve steady flow energy equation for various flow and non-flow thermodynamic systems. Compute heat and work interactions in thermodynamics systems .
		Evaluate efficiency of heat engine & COP of Heat Pump & Refrigerator. Compute change in Entropy in thermodynamics systems .
		Demonstrate the interrelations between thermodynamic functions to solve practical problems. Use of steam table to compute thermodynamics interactions.
		Find efficiency of Reciprocating Compressors, Differentiate between Rotary & Reciprocating Compressor.
		Illustrate mollier chart to compute thermodynamics interactions. Compute efficiencies of Gas & Vapour power cycles.
3	Strength of Materials (MEC303)	List various types of loading and stresses induced on section.
		Find the SFD and BMD for different types of loads and support conditions.
		Evaluate and analyse of direct, bending, shear stresses induced on Beam.
		Define the concept of twisting moment and its effect on bars of circular cross-sections. Compute & analyze of strain energy stored in the member due to different types of loading, Shear, Bending and Torsion.
		How the deflection of beams plays an important role in the engineering structures & Analyse Hoop stress and axial stress in a thin shell subjected to internal pressure.
		Analyse buckling and bending phenomenon in columns and beams respectively.
4	Production Process I (MEC304)	Demonstrate understanding of casting process .
		Illustrate principles of forming processes .
		Demonstrate applications of various types of welding processes.
		Distinguish chip forming processes such as turning, milling, drilling, etc.
		Illustrate the concept of producing polymer components and ceramic components.
		Distinguish between the conventional and modern machine tools.
5	Material Technology (MEC305)	Identify various crystal imperfections, deformation mechanisms, and strengthening mechanisms.
		Demonstrate understanding of various failure mechanisms of materials.
		Interpret Iron-Iron carbide phase diagram, and different phases in microstructures of materials at different conditions.
		Select appropriate heat treatment process for specific applications.
		Identify effect of alloying elements on properties of steels.
		Illustrate basics of composite materials, Nano- materials and smart materials.

## SHIVAJIRAO S. JONDHLE COLLEGE OF ENGINEERING &amp; TECHNOLOGY, ASANGAON

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## DEPARTMENT OF MECHANICAL ENGINEERING

ACADEMIC YEAR 2018-19

YEAR: SE

SEM: IV

SCHEME:CBCS

## COURSE OUTCOMES

Learner will be able to

SR.NO	SUBJECT	COURSE OUTCOMES
1	Applied Mathematics IV (MEC401)	Solve the system of linear equations using matrix algebra with its specific rules.
		Demonstrate basics of vector calculus.
		Apply the concept of probability distribution and sampling theory to engineering problems.
		Apply principles of vector calculus to the analysis of engineering problems.
		Identify, formulate and solve engineering problems.
		Illustrate basic theory of correlations and regression.
2	Fluid Mechanics (MEC402)	Define properties of fluids and classification of fluids. Compute Forces on surfaces due to hydrostatic pressure .
		Define equations for stream function, velocity potential function in rectangular and cylindrical co-ordinates. Compute stream function, velocity potential function in rectangular and cylindrical co-ordinates.
		Illustrate and solve equations of the control volume for fluid flow systems.
		Evaluate resistance to flow of incompressible fluids through closed conduits and over surfaces.
		Explain concept of boundary layer. Analyze laminar and turbulent boundary layers, drag, and boundary layer separation.
		Apply fundamentals of compressible fluid flows to relevant systems .
3	Production Process II (MEC404)	Demonstrate understanding of metal cutting principles and mechanism.
		Identify cutting tool geometry of single point and multipoint cutting tool.
		Demonstrate various concepts of sheet metal forming operations.
		Demonstrate concepts and use of jigs and fixtures.
		Illustrate various non-traditional machining techniques.
		Illustrate concepts and applications of additive manufacturing.
4	Kinematics of Machinery (MEC405)	Define various components of mechanisms.
		Construct and Compose mechanisms to provide specific motion.
		Design velocity and acceleration diagrams of various mechanisms.
		Construct CAM profile for the specific follower motion.
		Select appropriate power transmission mechanism.
		Select appropriate power transmission mechanism.
5	Industrial Electronics (MEC403)	Demonstrate characteristics of various electrical and electronics components.
		Develop simple applications built around these components.
		Identify use of different basic gates.
		Identify and use digital circuits for industrial applications.
		Built and demonstrate basic parameter measurement using microcontroller.
		Test and Analyse speed-torque characteristics of electrical machines for speed control.

## SHIVAJIRAO S. JONDHLE COLLEGE OF ENGINEERING &amp; TECHNOLOGY, ASANGAON

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## DEPARTMENT OF MECHANICAL ENGINEERING

ACADEMIC YEAR 2018-19

YEAR: TE

SEM: V

SCHEME:CBCS

## COURSE OUTCOMES

Learner will be able to

SR.NO	SUBJECT	COURSE OUTCOMES
1	Dynamics of Machinery (MEC504)	Demonstrate working Principles of different types of governors and Gyroscopic effects on the mechanical systems.
		Illustrate basic of static and dynamic forces.
		Determine natural frequency of element/system.
		Determine vibration response of mechanical elements / systems.
		Illustrate vibration isolation system for a specific application.
		Demonstrate basic concepts of balancing of forces and couples.
2	Mechanical Measurements and Control (MEC502)	Classify various types of static characteristics and types of errors occurring in the system.
		Classify and select proper measuring instrument for linear and angular displacement.
		Classify and select proper measuring instrument for pressure and temperature measurement.
		Analyse mathematical model of system/process for standard input responses.
		Analyse error and differentiate various types of control systems and time domain specifications.
		Analyse the problems associated with stability.
3	Internal Combustion Engines (MEC501)	Demonstrate the working of different systems and processes of S.I. engines.
		Demonstrate the working of different systems and processes of C.I. engines.
		Illustrate the working of lubrication, cooling and supercharging systems.
		Analyse engine performance .
		Illustrate emission norms and emission control.
		What are the different technological advances in engines and alternate fuels.
4	Press Tool Design (MEDLO5011)	Demonstrate various press working operations for mass production of sheet metal parts.
		Identify and build the concepts pertaining to design of press tools.
		Explain the working drawing and setup for economic production of sheet metal component .
		Select suitable material for different element of press tool.
		Illustrate the principles and blank development in bent & drawn components.
		Illustrate failure mechanisms of pressed components, safety aspects and automation in press working.
5	Heat Transfer (MEC503)	Identify the three modes of heat transfer.
		Illustrate basic modes of heat transfer.
		Develop mathematical model for each mode of heat transfer.
		Develop mathematical model for transient heat transfer.
		Demonstrate and explain mechanism of boiling and condensation.
		Analyse different heat exchangers and quantify their performance.

**SHIVAJIRAO S. JONDHLE COLLEGE OF ENGINEERING & TECHNOLOGY, ASANGAON**

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**DEPARTMENT OF MECHANICAL ENGINEERING**

ACADEMIC YEAR 2018-19

**YEAR: TE****SEM: VI****SCHEME:CBCS****COURSE OUTCOMES****Learner will be able to**

SR.NO	SUBJECT	COURSE OUTCOMES
1	Metrology and Quality engineering (MEC601)	Demonstrate the basic measurement unit and different gauges.
		Illustrate working principle of measuring instruments and calibration methodology.
		Illustrate basic concepts and statistical methods in quality control.
		Demonstrate characteristics of screw threads, gear profile, and tool profile.
		Illustrate the different sampling techniques in quality control.
		Illustrate different nondestructive techniques used for quality evaluation.
2	Refrigeration and Air Conditioning (MEC604)	Demonstrate fundamental principles of refrigeration and air conditioning .
		Identify and locate various important components of the refrigeration and air conditioning system .
		Illustrate various refrigeration and air conditioning processes using psychometric chart.
		Design Air Conditioning system using cooling load calculations.
		Estimate air conditioning system parameters.
		Estimate duct size and design concepts.
3	Machine Design I (MEC602)	Demonstrate understanding of various design considerations.
		Illustrate basic principles of machine design.
		Design machine elements for static as well as dynamic loading.
		Design machine elements on the basis of strength/ rigidity concepts.
		Utilize design data books in designing various components.
		Apply skill in preparing production drawings pertaining to various designs.
4	Finite Element analysis (MEC603)	Solve differential equations using weighted residual methods.
		Develop the finite element equations to model engineering problems governed by second order differential equations.
		Apply the basic finite element formulation techniques to solve engineering problems by using one dimensional elements.
		Apply the basic finite element formulation techniques to solve engineering problems by using two dimensional elements.
		Apply the basic finite element formulation techniques to find natural frequency of single degree of vibration system.
		Utilize commercial FEA software, to solve problems related to mechanical engineering.
5	Mechatronics (MEDLO6021)	Identify the suitable sensor and actuator for a mechatronics system.
		Select suitable logic controls.
		Analyse continuous control logics for standard input conditions
		Develop ladder logic programming.
		Design hydraulic/pneumatic circuits.
		Design a mechatronic system.

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**DEPARTMENT OF MECHANICAL ENGINEERING**

ACADEMIC YEAR 2018-19

**YEAR: BE****SEM: VII****SCHEME:CBGS****COURSE OUTCOMES****Learner will be able to**

SR.NO	SUBJECT	COURSE OUTCOMES
1	Machine Design -II (MEC701)	Design of spur, helical, bevel and worm Gears.
		Design of rolling contact bearings .
		Design of hydro dynamically lubricated bearings .
		Design of cam and roller follower.
		Design and selection of Belts .
2	CAD/CAM/CAE (MEC702)	Identify proper computer graphics techniques for geometric modeling.
		Explain the 2-D Transform, manipulate objects and store and manage data.
		Plan part programming applicable to CNC machines.
		Discuss rapid prototyping and tooling concepts in any real life applications.
		Identify the tools for Analysis of a complex engineering component.
3	Mechanical Utility Systems (MEC703)	Explain operating principles and performance of reciprocating compressors.
		Explain operating principles and performance of rotary compressors.
		Explain operating principles of pumps .
		Explain operating principles of centrifugal pumps and Illustrate and analyze characteristic curves of pumps .
		Interpret possibilities of energy conservation in pumping systems.
4	Production Planning and Control (MEC704)	Interpret possibilities of energy conservation in compressed air systems .
		Illustrate production planning functions and manage manufacturing functions in a better way.
		Develop competency in scheduling and sequencing of manufacturing operations.
		Discuss the inventory model, demand of the product and prepare an aggregate plan.
		Develop the skills of Inventory Management and cost effectiveness.
5	Operations Research (MEE7019)	Create a logical approach to Line Balancing in various production systems.
		Build techniques of manufacturing planning and control.
		Develop and improve of Industrial problem & Techniques by Linear Programming Problem.
		Develop and analysis of Engineering problems for optimization of cost and time.
		Apply and analyze mathematical optimization functions to Replacements and Queuing. .
6	Power Plant Engineering (MEE7012)	Discuss the Criterion and optimal cost effective strategies in various applications in industry .
		Discuss the Optimization to various inventory cost control in industry .
		Compare Recent trends in Automobiles .
		List various equipment/systems utilized in power plants.
		Demonstrate site selection methodology, construction and operation of Hydro Electric Power Plants.
		Discuss working, site selection, advantages, disadvantages of steam power plants.
		Discuss operation of Combined Cycle Power Plants.
		Discuss types of reactors, waste disposal issues in nuclear power plants.
		Illustrate power plant economics.



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## DEPARTMENT OF MECHANICAL ENGINEERING

ACADEMIC YEAR 2018-19

YEAR: BE

SEM: VIII

SCHEME:CBGS

## COURSE OUTCOMES

Learner will be able to

SR.NO	SUBJECT	COURSE OUTCOMES
1	Design of Mechanical Systems (MEC801)	Apply the concept of system design .
		Design of hoisting mechanism of EOT crane.
		Design belt conveyor systems .
		Design pumps for the given applications .
		Design engine components such as cylinder, piston, connecting rod and crankshaft .
		Design of machine tool gearbox .
2	Refrigeration and Air Conditioning (MEC803)	Demonstrate fundamental principles of refrigeration and air conditioning .
		Identify and locate various important components of the refrigeration and air conditioning system .
		Illustrate various refrigeration and air conditioning processes using psychometric chart .
		Design Air Conditioning system using cooling load calculations. .
		Estimate air conditioning system parameters .
		Demonstrate understanding of duct design concepts .
3	Industrial Engineering and Management (MEC802)	Illustrate need for optimization of resource and its significance in manufacturing industries..
		Develop capability in integrating knowledge of design along with other aspects of value addition in the conceptualization and manufacturing stage of various products. .
		Demonstrate the concept of value analysis and its relevance.
		Explain different concepts involved in methods study.
		Classify different aspects of work system design and facilities design pertinent to manufacturing industries..
		Identify various cost accounting and financial management practices widely applied in industries..
4	Automobile Engineering (MEE8026)	Compare Transmission systems, Live axle and differential.
		Discuss the Necessity of Brakes, Steering and Front axles.
		Discuss the Necessity of Suspension, Wheels and Tyres.
		Demonstrate the Electrical system.
		Analyse the forces concerned with Body Engineering.
		Discuss & compare the recent trends in Automobiles.
5	Renewable Energy Sources (MEE8022)	Demonstrate need of different renewable energy sources.
		Discuss importance of renewable energy sources.
		Discuss various renewable energy sources in Indian context.
		Evaluate and analyse utilization of solar and wind energy.
		Illustrate design of biogas plant.
		Demonstrate basics of hydrogen energy.

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## DEPARTMENT OF MECHANICAL ENGINEERING

ACADEMIC YEAR 2018-19

YEAR: ME

SEM: I

SCHEME:CBCS

## COURSE OUTCOMES

Learner will be able to

SR.NO	SUBJECT	COURSE OUTCOMES
1	Energy scenario, policy and environment (ESMC101)	Define the role of energy in global economic development.
		Analyze energy consumption pattern in India and its effect on economic development..
		Determine impact of International energy policy on national energy growth..
		discuss the Indian and International energy policies.
		Analyze Industrial Energy and environment .
		Explain relationship between energy, ecology and environment.
2	Energy efficiency in thermal system (ESMC102)	Define the reasons of incomplete combustion and attempt to reduce the subsequent impact..
		Discuss the ENCON opportunities and Furnace..
		Discuss the ENCON opportunities and Boilers..
		Measure performance evaluation of cogeneration.
		Determine ENCON opportunities in thermal systems.
		Measure and improve the quality of recovered waste energy.
3	Conventional power plant (ESMC103)	Distinguish between energy & power and understand power plant cycles in detail.
		Explain steam systems and steam power plant installation, operation, maintenance, and life cycle economics.
		What are Hydroelectric power plants site selection and elements..
		Illustrate Gas Turbine power plants site selection and elements.
		Illustrate nuclear power plant installation, operation, maintenance, and life cycle economics.
		Define the advantages and disadvantages of combined operation of power plants.
4	Utilization of solar energy (ESMDLO1011)	Estimate and quantify available solar radiation.
		Discuss simulation of solar processes.
		Explain the Solar Photovoltaic cells.
		Identify and describe the basic principles and methodologies of solar systems.
		Design the solar energy collection system.
		Discuss the basic economics of solar energy systems.
5	Energy audit and management (ILO1018)	Identify and describe present state of energy security and its importance.
		Identify and describe the basic principles and methodologies adopted in energy audit of an utility..
		Define energy audit principles.
		Discuss the energy performance evaluation of some common electrical installations and identify the energy saving opportunities.
		Explain the energy performance evaluation of some common thermal installations and identify the energy saving opportunities.
		Explain the energy performance evaluation of some common thermal installations and identify the energy saving opportunities.

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## DEPARTMENT OF MECHANICAL ENGINEERING

ACADEMIC YEAR 2018-19

YEAR: ME

SEM: II

SCHEME:CBCS

## COURSE OUTCOMES

Learner will be able to

SR.NO	SUBJECT	COURSE OUTCOMES
1	Advances in energy audit and management (ESMC201)	Distinguish between energy auditing stages & detailed energy auditing procedure.
		Explain Energy Auditing in PAT Cycle Explain the Roles of Energy manager and Energy audit.
		Discuss the Monitor and setting target in energy consumption..
		Discuss the framework of PAT cycle and understand M&V audit.
		Discuss the framework of PAT cycle and understand M&V audit.
		Discuss the commercial energy audits.
2	Energy efficiency in electrical systems (ESMC202)	Evaluate losses in electrical and power systems and improve its energy efficiency..
		Determine ENCON opportunities in Fan, Blowers and Compressors.
		Determine ENCON opportunities in HVAC Systems.
		Determine ENCON opportunities in electrical motor systems.
		Determine ENCON opportunities in fluids handling systems.
		Determine ENCON opportunities in lighting systems.
3	Renewable and sustainable energy systems (ESMC203)	Discuss sustainability initiatives for reducing energy impacts on environment.
		Explain the solar energy Technology.
		Explain the Wind power Technology.
		Discuss the role of renewable energy in climate change..
		Determine the efficient solar and wind energy technology.
		Discuss the current trends in sustainable and renewable energy.
4	Fuels combustion and emission control (ESMDLO2022)	Distinguish between conventional, non-conventional and nuclear fuels.
		Explain the types and production process of fuels.
		Determine the requirements for complete combustion process.
		List the Emission control methods .
		Analyse the effects of emission control.
		Discuss the combustion of fuels.
5	Research methodology (ESMDLO2022)	Explain a preliminary research design for projects in their subject matter areas.
		Explain the accurately collect, analyze and report data.
		Explain the IPR .
		Analyze research findings.
		List the various Research techniques for research data collection.
		Discuss present complex data or situations clearly.

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DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2018-19

YEAR: SE

SEM: III

SCHEME: CBCS

## COURSE OUTCOMES

After Successful completion of course student will be able to

SR.NO	SUBJECT	COURSE OUTCOMES
1	Applied Mathematics -III (CE-C 301)	Solve the Ordinary and Partial Differential Equations using Laplace Transformation.
		Apply Fourier series to Solve Ordinary and Partial Differential Equations.
		Solve initial and boundary value problems involving ordinary differential equations
		Apply the concept of curve fitting, correlation and regression to solve engineering problems.
		Apply bilinear transformations and conformal mappings
2	Surveying - I (CE-C 302)	Identify the applicability of theorems and evaluate the contour integrals
		Explain the basic principles of surveying, measurement and errors.
		Demonstrate modern survey equipment to measure angles and distances.
		Measure differences in elevation, draw and utilize contour plots, and calculate volumes for earthwork
		Develop the assigned field work and prepare report
3	Strength of Materials (CE-C 303)	Discuss and evaluate Theodolite, temporary adjustments, different methods of Theodolite traversing & error in it.
		Explain principle, purpose, suitability of tacheometry, different methods of tacheometry, stadia formula, stadia diagram & tables.
		Analyze the flexural members for its structural behaviour under the effect of flexure ( bending), shear & torsion either independently or in combinations thereof
		Interpret the concepts of shear force, bending moment, axial force for statically determinate beams & compound beams having internal hinges & subsequently, its application to draw shear force, bending moment
		Evaluate the deformation behaviour of axially loaded columns considering wind load ( chimneys, dams etc.) & behaviour of direct & bending stresses with various safety conditions
		Discuss the behaviour of the structural members under the action of axial load, bending & twisting moment
4	Engineering Geology (CE-C 304)	Evaluate the deformation behaviour of axially loaded columns having different end conditions & strength of such columns.
		Explain the principal stress & strain in a two dimensional strain body using analytical and graphical methods
		Explain the significance of geological studies in design of civil engineering structure and demonstrate the knowledge of geology to explain major geological processes.
		Summarize the properties of building stone Classify the minerals and explain formation, properties and engineering applications of different types of rocks.
		Explain various geological structures, relate their significance in the design and construction of major civil engineering projects.
		Categorize physiographic divisions of India and describe their characteristics
5	Fluid Mechanics-I (CE-C 305)	Discuss geological investigation methods, advantages and disadvantages caused due to geological conditions during the construction of dam and tunnel.
		Identify subsurface information and groundwater potential sites through geophysical investigations & Apply geological principles for mitigation of natural hazards like landslide, volcano and earthquake.
		Define the fluid properties & basic fundamental concepts along with identification of fluids types with relevance in civil engineering
		Discuss the various hydrostatic fundamentals like Pascal's laws, hydrostatic law, buoyancy principle & their distinguish role in civil engineering
		Illustrate the fluid kinematics & interpret their methodology towards engineering needs
		Discuss the Bernoulli's equation & its role in civil engineering
5	Fluid Mechanics-I (CE-C 305)	Examine the role of various flow measuring devices & employ them in engineering practices & projects
		Choose the appropriate equipment's as per engineering need & compare various devices accordingly

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DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2018-19

YEAR: SE

SEM: IV

SCHEME:CBCS

## COURSE OUTCOMES

After Successful completion of course student will be able to

SR.NO	SUBJECT	COURSE OUTCOMES
1	Applied Mathematics - IV (CE-C 401)	Apply the concept of eigen values and eigen vectors to find functions of square matrix.
		Apply basics of vector calculus to find area and volume of a given surface.
		Construct linear programming problems and solve them using various methods.
		Solve problems on Binomial, Poisson and normal distribution.
		Identify, formulate and solve problems on sampling (large and small samples).
2	Surveying - II (CE-C 402)	Classify and solve problems on variance (Analysis of variance)
		Design the safety performance of horizontal curves on two-way, two-lane rural roads relative to tangent segments.
		Design Vertical curve provides a transition between two sloped roadways dependent on the intended design speed for roadway.
		Estimate grids of levels over a site and use them to establish contours and carry out volume calculations.
		Measure slope distance, vertical angle, and horizontal angle from total station.
		Determine & define land ownership and boundaries
3	Structural Analysis - I (CE-C 403)	Predict local survey terminologies like tehsildar, 7/12, utara, namuna, etc. Introduction to Survey of India Department; Department of Registration and Stamps, Maharashtra.
		Analyze statically determinate portal frame, skew frame & gable frame with & without internal hinge & to find out the internal forces such as axial force, shear force, BM & twisting moment etc.
		Apply basic concepts, principles & methods to evaluate slope & deflection of beams, frames & trusses
		Analyze eccentrically loaded columns, buckling behavior of axially & transversely loaded beam columns
		Determine the response of beams & trusses under rolling loads & subsequently to obtain absolute max. bending moment
4	Building Design and Drawing (CE-C 404)	Analyze the structures such as arches & suspensions bridges & three hinged stiffening girders
		Discuss the concept of unsymmetrical bending & shear center & its application in solving the problems of structural mechanics
		Explain various provisions of IS CODE and NATIONAL BUILDING CODE regarding planning, permissions and relate byelaws.
		Summarize the types of structures and its various components like doors, windows, staircase, foundations etc.
		Design various components of buildings as well as buildings as a whole. Draw and explain plans, elevation and one-point perspective and two point perspective of buildings.
		Apply principles of planning, architectural planning and building bye laws while designing and preparing building drawings.
5	Building Materials and Construction Technology (CE-C 405)	Illustrate planning of green buildings and analyze certification methods.
		Plan the computer aided drawing (cad) using any one available software.
		Explain different types of building materials and their requirements.
		Explain the manufacturing Process and Properties of Basic Construction Materials.
		Explain manufacturing process and properties of concrete. Describe laboratory tests. Explain Admixtures, their tests and chemistry and compatibility with concrete
		Explain manufacturing process, properties and applications of glass fibre reinforced plastic, Timber (wood).
6	Fluid Mechanics-II (CE-C 406)	Design Concrete mix by I.S. method. Explain manufacturing process of Ready mix concrete.
		Define Masonry Construction and Masonry Finishes and Describe the different types of floor and roofs coverings & different types of Formwork Materials used and design considerations.
		Identify different types of pipe flow & compute fluid velocity undertaking minor & major losses.
		Explain water hammer phenomenon & solve pipe network.
		Illustrate the compressible flow & analyze Mach number
		Distinguish different types of boundary layer phenomenons & determine their applications & characteristics
6	Fluid Mechanics-II (CE-C 406)	Explain Reynold's equation & classify types of flow
		Evaluate pressure drop in pipe flow by applying Hagen – Poiseuille's equation

## COURSE OUTCOMES

After Successful completion of course student will be able to

SR.NO	SUBJECT	COURSE OUTCOMES
1	Structural Analysis - II (CE-C 501)	Discuss the behavior of various statically indeterminate structures.
		Analyze the structures including two hinged arches.
		Analyze these structures to find out the internal forces.
		Contrast between the concept of force and displacement method of analysis of indeterminate structures.
		Explain the concept of plastic hinge, plastic moment, shape factor and collapse load.
		Find out the approximate of dimension of beam and columns using the approximate method for giving the input in design software.
2	Geotechnical Engineering-I (CE-C 502)	Illustrate soil types, their engineering properties, relationship between them.
		Explain plasticity of soil, different index properties and discuss about clay minerals.
		Classify soils as per Indian standards. Discuss different methods of analysis.
		Explain permeability and seepage in soil and calculate permeability of soil.
		Analyze effective stress for given soil condition. Explain geosynthetics.
Summarize compaction of soil and methods of soil exploration, interpret result with compaction of soil.		
3	Applied Hydraulics (CE-C 503)	Apply the concepts of fluid dynamics to analyse and solve pipe bend and sprinklers problems.
		Evaluate and apply the dimensional analysis and model laws.
		Assess the impact of jet on stationary flatplate and curved plate and explain the concept of jet propulsion of ships.
		Analyze the working and functions of pelton wheel, reaction, francis, kaplan turbin, centrifugal pump and reciprocating pump.
		Outline the basic concept of open channel flow, evaluate the most economical sections of channels and measure velocity and discharge through open channel
		Categorize various type of flow, discuss concept of specific energy curve and gradual varied flow and also predict the occurrence of hydrolic jump and its parameters.
4	Environmental Engineering-I (CE-C 504)	Plan, design and construction of water systems.
		Illustrate the water related infrastructural facilities .
		Discover a practical alignment to that they can improve practical solutions to our society
		Examine a everyday orientation to environmental problems in our society
		Assess the depth of students about a theoretical knowledge in engineering sciences and in research field
		Measure the positive responsive vocational attitudes, initiative creative thinking in their mission as engineers
5	Transportation Engineering - I (CE-C 505)	Explain planning requirements of different types of highways. Conduct surveys and prepare report
		Design geometric design elements of highways
		Discuss traffic study and explain traffic control devices and Intersections
		Explain materials used for highway construction and soil stabilization and geosynthetics
		Explain pavement design of various pavements and IRC requirements for pavement design
		Explain construction of different types of roads and Investigate failure of pavements and suggest strengthening measures and highway drainage
6	DLOC-Advance concrete Technology (CE-DLO5062)	Identify various types of material and properties in concrete.
		Define the various properties of special concrete
		Explain the mix design by different methods
		Identify the knowledge of fiber reinforced concrete.
		Explain the different procedures for testing
Discuss the concept of durability and cracking in concrete.		
7	DLOC-Building Services & Repairs (CE-DLO5063)	Compare the best utility services and installation.
		Distinguish and execute different plumbing systems.
		Create and execute different Electric System in building and Explain modern theory of light and colour.
		Summarize problems associated with concrete deterioration and suggest solution of it
		Design and evaluate damage to the structure by different methods.
Experiment with survey of structural concrete & Rebars, suggest its protection techniques		

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DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2018-19

YEAR: TE

SEM: VI

SCHEME:CBCS

## COURSE OUTCOMES

After Successful completion of course student will be able to

SR.NO	SUBJECT	COURSE OUTCOMES
1	Geotechnical Engineering-II (CE-C 601)	Explain consolidation and determine consolidation.
		Summarize behavior and strength of the soil such as earth retaining, rigid retaining wall.
		Identify different types of shallow foundations and establish the most economical design of structures.
		Illustrate the effect of dynamic interaction between pile-foundations & soil on strength demand spectra
		Examine tensile strength of fibre reinforced soil increases with increasing dry density.
2	Design and Drawing of Steel Structures (CE-C 602)	Analyze effects of foundation stiffness on failure mechanisms & strength of foundation soil.
		Explain the Limit State Design philosophy as applied to steel structures.
		Design members subjected to axial compression,tension and their connection.
		Design members subjected to bending, shear and their connection.
		Demonstrate ability to follow IS code,design tables and aids in analysis and design.
3	Transportation Engineering - II (CE-C 603)	Evaluate loading for truss and design the complete truss.
		Analyze and design the commercial steel structures and prepare the drawing.
		Explain role of transportation systems in Society.
		Discuss different transportation modes, Planning coordination of different modes.
		Explain planning, construction and maintenance of Railway tracks.
4	Environmental Engineering-II (CE-C 604)	Explain planning, construction and different types of airports.
		Elaborate in detail the maintenance of airports.
		Explain Water Transportation system in details and its facilities, including harbors docks, port facilities.
		Evaluate the role of sanitation in the urban water cycle, its relation to public health and environment
		Analyze of characteristics of sewage treatment process
5	Water Resource Engineering.-I (CE-C 605)	Analyze of biological processes and their mutual relationships within various sanitation components
		Discuss the treatment, Reclamation and resource recovery and re-use at both centralized and decentralized levels
		Estimate the characteristics of sludge and its disposal of drying beds.
		Explain Environmental pollution in relation to properties and its occupational hazards. As compare to quality standards and to know the control measures.
		Classify various types of irrigation projects
6	DLOC -Advance construction equipments (CE-DLO6061)	Explain different irrigation method and effective use of water resources.
		Analyze the crop water requirement and irrigation requirement
		Demonstrate hydrographs and evaluate runoff of a catchment area.
		Discuss the steady and unsteady state conditions of any aquifer and water wells.
		Analyze the capacity of reservoir for different purposes.
7	DLOC -Ground Improvement Techniques (CE-DLO6063)	Explain the use/applications of various conventional construction equipment and select the best out of them for a particular site requirement.
		Evaluate to review of modern methods used for underground as well as underwater tunnelling.
		Distinguish conventional and modern methods of formwork on the basis of productivity,reuse value,ease of erection and dismantling,flexibility offered and overall cost.
		Adapt knowledge of the techniques involved and equipment required there of for construction of various transporting facilities.
		Build knowledge about the setting up of different kinds of the power generating structures.
8	Software Applications in Civil Engineering (CE-C607)	Choose proper equipment for construction of transporting facilities based on requirements.
		Explain problematic soils and their associated issues.
		Discuss various the various ground improvement techniques and propose suitable remedial techniques and design.
		select appropriate soil improvement technique based on the soil type and application.
		Analyze grouting for various engineering applications in field.
		Analyze stone column layout
		Analyze the geotechnical structures with the pseudo-static method under seismic condition.
		Explain the use of softwares in various disciplines of Civil Engineering
		Demonstrate the ability to use the software in chosen field and provide solutions to field problems
		Identify open source softwares used in case of specific problems.
		Explain the software results using judgment about range of answers.
		Identify the software application in particular field of Civil Engineering
		Apply Independently different software's for specific problems

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DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2018-19

YEAR: BE

SEM: VII

SCHEME:CBGS

## COURSE OUTCOMES

After Successful completion of course student will be able to

SR.NO	SUBJECT	COURSE OUTCOMES
1	Limit State Method for Reinforced Concrete Structures (CE-C701)	Explain ultimate strength theory, stress block. Analyze and design singly reinforced section and doubly reinforced sections using Whitney's approach
		Explain various limit states and interpret IS 456 provisions.
		Analyze and design members Limit state of collapse in flexure, shear, bond, torsion and serviceability. Analyze and design singly and doubly reinforced rectangular and T sections. Explain and draw reinforcement detailing.
		Analyze and design one way and two way slabs
		Analyze and design columns subjected to combined axial and uni-axial as well as biaxial short and slender column.
		Analyze and design single and combined footings, slab beam type footing and strap footing subjected to axial load and moments.
2	Quantity Survey Estimation and Valuation (CE-C702)	Estimate approximate cost and prepare detailed estimates of various civil engineering structures by referring drawings.
		Develop bar bending schedules and construct mass haul diagrams.
		organize the specifications for various items of work.
		Determine unit rates of items of work.
		Compile tender notice and explain the terms in contract.
		Determine the present fair value of any construction building at stated time.
3	Irrigation Engineering (CE-C703)	Explain basic requirements of irrigation and analyze its advantages, disadvantages, types of projects, national perspective.
		Illustrate Crops and their water requirements. explain irrigation methods . analyze soil-water relationship.
		Evaluate the hydrological cycle and rainfall measurements. Calculate runoff, flood discharge. Explain methods of deriving unit hydrograph, S-hydrograph.
		Apply knowledge on ground water, well hydraulics to estimate the safe yield and ground water potential.
		Explain investigations and planning of reservoir. calculate capacity and fixation of control levels. describe reservoir sedimentation and its control.
		Analyze forces acting on dams and carry out stability analysis. Explain rock-fill dams. Arch and buttress dams. Describe types of spillways, other energy dissipating devices.
4	Environmental Engineering - II (CE-C704)	Importance of sanitation in the urban water cycle, its relation to public health and environment
		Develop rational approaches towards sustainable wastewater management via pollution prevention
		Analyze of physical, chemical and biological processes and their mutual relationships within various sanitation components
		Measure the development of innovative approaches to the provision of adequate and sustainable sanitation services
		Classify the treatment, reclamation and resource recovery and re-use at both centralized and decentralized levels
		Explain Environmental pollution in relation to properties and its occupational hazards.
5	Elective - I Prestressed Concrete (CE-E705)	Explain the Basic concept of Prestressed Concrete, materials used and their properties, methods, techniques and systems of prestressing.
		Analyze the Prestressed concrete sections by different methods
		Evaluate the Losses in Prestress and deflections of Prestressed Concrete Members for various conditions.
		Design Prestressed Concrete Sections for Flexure and shear.
		Evaluate End zone stresses in prestressed concrete members Introduction to application of prestressing to continuous beams and slabs, linear transformation and concordancy of cables.
		Explain application of prestressing to continuous beams and slabs, linear transformation and concordancy of cables.
6	Elective - I Reinforced Concrete Repairs Maintenance (CE-E705)	Explain Causes of deterioration of concrete structures durability
		Discuss the Condition Survey, Evaluation and Damage Assessment of buildings. explain Destructive, semi-destructive and non-destructive methods
		Compare various repair Materials and Repair Methodologies including use of polymer concrete.
		Explain Protection of Concrete Structures using Protective materials ,Systems like integral, crystalline, coatings, membranes and Thermal protection coatings
		Explain corrosion protection methods including corrosion inhibitors, Corrosion resistant steels, cathodic protection, Pre-packed zinc sacrificial anode, Snap-on zinc mesh anode CP system.
		Discuss planning Maintenance of Concrete Structures, preventive maintenance , Statutory legislation and obligation



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NAAC Accredited B++

DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2018-19

YEAR: BE

SEM: VIII

SCHEME:CBGS

## COURSE OUTCOMES

After Successful completion of course student will be able to

SR.NO	SUBJECT	COURSE OUTCOMES
1	Design and Drawing of reinforced concrete structures ( CE-C801)	Analyze and Design simple raft subjected to symmetrical loading using limit state method
		Analyze and Design of dog legged and open well type staircase using limit state method
		Develop the complete analysis and design of residential and industrial buildings.
		Analyze and Design cantilever and counter fort type retaining wall using limit state method
		Analyze and Design Circular and rectangular of Water Tanks at ground level, underground and overhead water tank both by IS coefficient and - approximate methods, including supporting structure for overhead water tanks using working stress method
		Analyze and Design Circular and rectangular of Water Tanks at ground level, underground and overhead water tank both by IS coefficient and - approximate methods, including supporting structure for overhead water tanks using working stress method
2	Construction Engineering (CE-C802)	Develop the knowledge of concepts, principles and applications of soil under dynamic loading
		Create an ability to design with reference to code provisions and solve the practical soil problems subjected to vibrations.
		Organize an impetus to new developments in related dynamic topics.
		Evaluate owning and operating costs, evaluate maintenance and repair costs.
		Explain the complex processes involved in the construction of tunnels
		Apply the concept of mass concreting, vacuum concreting and modern slip forms in construction projects.
3	Construction Management (CE-C803)	Apply the knowledge of management functions like planning, scheduling, executing and controlling to construction projects.
		Explain roles and responsibilities of various agencies of construction projects and design a site layout.
		Demonstrate the capability of preparing the project networks to workout best possible time for completing the projects.
		Develop optimum relationships between time and cost for construction projects.
		Utilize the knowledge of managing various resources and recommend best method for allocating resources to project.
		Adapt quality and safety measures on construction sites during execution of civil engineerin project and understand importance of labour legislation.
4	Elective - II Disaster Management (CE-E804)	Explain global and Indian scenario of disaster, importance of study in human life, Direct and indirect effects of disasters.
		Analyze various Natural Disaster and Manmade disasters, causes and management for mitigation.
		Adapt Disaster Management, Policy and Administration
		Summarize Institutional Framework for Disaster Management in India, NIDM and NDMA. Applications of GIS, Remote sensing and GPS.
		Explain Financing Relief Measures including raising finance, Legal aspects related to finance raising as well as overall management of disasters. International relief aid agencies and their role in extreme events
		Propose Preventive and Mitigation Measures at Pre-disaster, during disaster and post-disaster stages. Analyze Risk mapping, assessment.
5	Elective - II Advanced Repairs and Rehabilitation of Structures (CE-E804)	Demonstrate the reasons for strengthening of structures.
		Explain structural strengthening of RC members by jacketing. Describe external post-tensioning plate bonding, textile reinforced concrete
		Analyze Specialized repairs methods like Electro chemical repair using re-alkalization and chloride extraction techniques. Explain repair of various structures like tunnels, runways etc.
		Classify Retrofitting by all types of Composite Materials
		Explain Seismic Retrofitting of existing RC structures. Analyze use of FRP for retrofitting of damaged structures & plan Protection and Maintenance schedule all structures

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**ACADEMIC YEAR 2018-19**

**YEAR: FE( ME)**

**SEM: I**

**SCHEME:CBCS**

**COURSE OUTCOMES**

**After Successful completion of course student will be able to**

SR.NO	SUBJECT	COURSE OUTCOMES
1	Probability and Statistics (CEMC101)	Examine the quantitative data and draw results from it using probability distribution to project management.
		Apply sampling techniques to construction industry
		Apply correlation analysis techniques and develop linear regression equation between various civil engineering parameters
		Apply regression analysis in resources management and prediction of concrete structures
		Predict the performance of a particular system, based on past performance using simulation and other tools.
		Apply Griffi's waiting line models and other such models to decide the optimum number of servicing units required for a prime mover
2	Management and project planning in construction (CEMC102)	Analyze and explain the contributions of various researchers Henry Fayol, Fredrick Taylor etc. in modern management.
		Explain the concept of project Life cycle, the responsibilities of project managers & PMCs, define the scope of the Project and various documentations required on major projects
		Prepare project schedule using different methods using primavera, MSP. Apply CPM PERT techniques.
		Explain project controlling and related issues. explain incentives & work study applications for civil engineering projects
		Analyze various domains of construction management as regards to mobilization, demobilization, co-coordinating, communicating, reporting and training aspects
		Identify the causes of accidents on construction site, suggest Preventive measures and discuss various acts for safety.
3	Construction Contract Administration and Management (CEMC103)	Explain the basic procedure of bidding for construction projects
		Explain different types of contract along with their suitability in construction practices with various issues like specifications, breach of contract.
		Explain different methods for resolving the disputes arisen
		Analyze various industrial acts & their relevance to construction Industry
		Compare bailment procedure and related issues
		Explain injunctions, indemnity and guarantee
4	Repairs, Rehabilitation & Retrofitting of Structures (DLOC102)	Explain Need for strengthening due to various reasons and explain holistic models for deterioration of concrete
		Explain Condition Survey for identification and estimation of damage and Non-Destructive and Destructive Testing Methods. analyze, interpret the data and draw conclusions.
		Compare various Repair Materials and their selection, essential parameters
		Analyze different Repair/ Rehabilitation Techniques for materials, procedures advantages etc.
		Develop Guidelines for Repair and Rehabilitation Work and Post repair inspection and maintainance.
		Explain Seismic retrofitting and Maintenance of Heritage Structures
5	Disaster Management and Mitigation Measures (ILOC1017)	Explain the global and Indian scenario of disaster, importance of study in human life, Direct and indirect effects of disasters.
		Analyze various Natural Disaster and Manmade disasters, causes and management for mitigation.
		Explain Disaster Management, Policy and Administration
		Explain Institutional Framework for Disaster Management in India, NIDM and NDMA. Applications of GIS, Remote sensing and GPS.
		Explain Financing Relief Measures including raising finance, Legal aspects related to finance raising as well as overall management of disasters. International relief aid agencies and their role in extreme events
		Explain Preventive and Mitigation Measures at Pre-disaster, during disaster and post-disaster stages. Analyze Risk mapping, assessment.

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DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2018-19

YEAR: FE( ME)

SEM: II

SCHEME:CBCS

**COURSE OUTCOMES****After Successful completion of course student will be able to**

SR.NO	SUBJECT	COURSE OUTCOMES
1	Advanced Construction Technology (CEMC201)	Summarize the construction of underwater and underground construction and various activities involved, machinery used and precautions
		Explain various form systems Formwork and design requirements, materials used.
		Explain Construction systems for High Rise structures and Prefabricated Construction techniques, Special techniques required for construction and maintenance.
		Explain construction of transporting facilities like Roads and Bridges, Railways and Ports.
		Propose action plan for the various construction activities for Power Generating Structures.
		Adapt action plan for Hydro power station, Atomic power Stations, Thermal power station, Windmills, Solar Power, transmission towers.
2	Infrastructure Development (CEMC202)	Discuss the role of infrastructure in overall development of the nation. Analyze global and Indian perspective and roles of various agencies involved in construction industry
		Classify infrastructure projects and explain major achievements in infrastructure sector in India.
		Discuss financing of infrastructure projects and various issues like GDP and its role, government policies & strategies, sources of financing infrastructure projects, FDI in construction industry.
		Explain the concept of public private partnership & its implementation in practice. compare various PPP models involved in construction industry and role of role and functions of PMC in infrastructure projects
		Explain issues related to infrastructure development like environmental clearances. Role of FICCI.
		Explain delay and failures in infrastructure projects. Analyze causes of delay; calculate cost over-run and time over runs.
3	Project Economics & Financial Management (CEMC203)	Explain the principles of economics and analyze factors bearing on size of firms, obstacles to growth of firms.
		Analyze the various issues affecting working capital and estimate the working capital required on a construction project
		Evaluate cost implication to different forms of construction. Calculate break-even analysis.
		Explain financial planning and various issues like stock, borrowings, debentures, shares, venture capital financing, SEBI regulations, micro financing.
		Illustrate capital budgeting and project portfolio analysis
		Explain corporate sector and corporate tax planning, role of financing institutes in construction, CIDC-ICRA grading.& various terms related to accounting and prepare construction accounts.
4	Energy Conservation Techniques in Building Construction (DLOC204)	Explain energy systems, production and conservation. Explain energy and its impact on environment like heat- iceland effect, greenhouse gas effect, global warming.
		Explain energy management system. Prepare energy audit and explain post audit activities.
		Plan energy efficient & environment friendly design of heating and ventilation systems. Explain solar energy fundamentals and prepare active solar and passive solar design. Explain principles and design of green buildings.
		Explain Energy Saving Opportunities in various Building Services, like Lighting Systems, Air Conditioning Systems, Water Heat Recovery, and Savings in Pumps-Fans-Compressed air systems.
		Explain energy systems and savings through case studies.
5	Research Methodology (ILOC206)	Explain primary characteristics of quantitative research and qualitative research. Explain describe Need of Research in Business and Social Sciences, identify Issues and Problems in Research.
		Compare Types of Research like Basic Research, Applied Research, Descriptive Research, Analytical Research etc.
		Explain Research Design and Sample Design techniques.& the stages in Research process such as identification of problem to Preparation of Research Report
		Explain Formulation of Research Problem and related issues like Interest, Data Availability, Choice of data, Analysis of data, Generalization and Interpretation of analysis.
		Explain the Preparation of the report on conclusion reached and its contents like Validity Testing & Ethical Issues, Suggestions and Recommendation