SHIVAJIRAO S. JONDHLE COLLEGE OF ENGINEERING & TECHNOLOGY, ASANGAON
NAAC Accredited B++
List of PSO's for all Deparment for AY 2019-20

Sr.No.	Name of Deparment	List Of PSO's
1	ELECTRONICS AND TELECOMMUNICATION ENGG	**PSO 1:** Apply fundamentals of electronics in various domains of analog and digital systems.
		PSO 2: Build a model by applying profound knowledge in Communication, Signal Processing, Image Processing and VLSI along with programming & simulation tools for research and advancement.
		PSO 3: 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	**PSO 1: Professional Skills**: 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
		PSO 2: Problem-Solving Skills: 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
		PSO 3: Successful Career and Entrepreneurship: 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	**PSO 1:** Students should be able to solve problems in the field of design, thermal and Production Engineering.
		PSO 2: Students should be able to analyze mechanical systems and simulate using Software
		PSO 3: Students should be able to resolve issues related to renewable energy sources and contribute to reduce atmospheric pollution
4	CIVIL ENGINEERING	**PSO1** :The graduates will have the ability to plan, analyze, construct and maintain cost effective civil engineering structures.
		PSO2: The graduates will have the ability to take up employment, entrepreneurship, research and development for sustainable civil society.
		PSO3 :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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NAAC Accredited B++
List of PO's for all Deparment for AY 2019-20

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

SHIVAJIRAO S. JONDHLE COLLEGE OF ENGINEERING & TECHNOLOGY, ASANGAON
NAAC Accredited B++
DEPARTMENT OF ELECTRONICS AND TELECOMMUNICATION ENGINEERING
ACADEMIC YEAR 2019-20

YEAR: SE　　　　　　　　　　**SEM: III**　　　　　　　　　**SCHEME:CBCS**
COURSE OUTCOMES

Learner 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 Telecomunication 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 givensystem 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

SHIVAJIRAO S. JONDHLE COLLEGE OF ENGINEERING & TECHNOLOGY, ASANGAON
NAAC Accredited B++
DEPARTMENT OF ELECTRONICS AND TELECOMMUNICATION ENGINEERING
ACADEMIC YEAR 2019-20

YEAR: SE **SEM: IV** **SCHEME:CBCS**
COURSE OUTCOMES

Learner will be able to

SR.NO	SUBJECT	COURSE OUTCOMES
1	APPLIED MATHMATICS -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.
		Apply the concept of line Integral & Residue Theorm to evaluate Integrals of different types.
2	ELECTRONIC DEVICES AND CIRCUITS-II (ECC402)	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.
		Analyze the different feedback topologies.
		Explain and Design the different oscillator circuits.
3	LINEAR INTEGRATED CIRCUITS (ECC-403)	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
		Explain analog to digital and digital to analog converter
		Discuss fucntion and applications of special function Ics.
		Discuss fucntion and applications of voltage regulators.
4	SIGNALS AND SYSTEMS (ECC404)	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.
		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.
5	PRINCIPLES OF COMMUNICATION ENGINEERING (ECC405)	Outline the basics of communication system.
		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.
6	ELECTRONIC DEVICES AND CIRCUITS-II LAB (ECL401)	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.
7	LINEAR INTEGRATED CIRCUITS LAB (ECL-402)	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.
8	PRINCIPLES OF COMMUNICATION ENGINEERING LAB (ECL403)	Demonstrate different type of Modulation and Demodulation
		Demonstrate different type of Pulse Modulation and Demodulation
		Demonstrate different type Multiplexing techniques
		Make use of MATLAB to illustrate different types of Modulation.

SHIVAJIRAO S. JONDHLE COLLEGE OF ENGINEERING & TECHNOLOGY, ASANGAON

NAAC Accredited B++

DEPARTMENT OF ELECTRONICS AND TELECOMMUNICATION ENGINEERING

ACADEMIC YEAR 2019-20

YEAR: TE **SEM: V** **SCHEME:CBCS**

COURSE OUTCOMES

Learner 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
		Design elementary aspect of microprocessor based system
2	DIGITAL COMMUNICATION (ECC502)	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.
		Evaluate different method to eliminate Inter-symbol interference.
		Explain optimum reception of digital signal.
3	ELECTROMAGNETIC ENGINEERING (ECC503)	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.
		Analyse Maxwell's equations and explain electromagnetic wave propagation.
		Analyse transmission line parameters and calculate them using smith chart.
		Explain applications of electromagnetics.
4	DISCRETE TIME SIGNAL PROCESSING (ECC504)	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.
		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.
5	TV AND VIDEO ENGINEERING (ECCDLO 5012)	Explain types of picture tubes ,scanning & Transmission & Reception of signals
		Classify Colour Television system characteristics and different types of encoding systems
		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
6	MICROPROCESSOR AND PERIPHERALS INTERFACING LAB (ECL501)	Discuss and draw architecture of microprocessor.
		Compile different tasks on microprocessor 8086 by using debug.
		Design the interface of peripheral with 8086.
7	DIGITAL COMMUNICATION LAB (ECL502)	Illustrate and verify sampling theorem.
		Illustrate various line code using MATLAB.
		Analyze bandpass modulation and demodulation technique using MATLAB.
		Analyze different error correcting codes by using MATLAB.
8	BUSINESS COMMUNICATION AND ETHICS LAB (ECL503)	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.
		Illustrate employment skill like presentaiton skill, interview technique and group discussion.
9	OPEN SOURCE TECHNOLOGY FOR COMMUNJICATION LAB (ECL504)	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.

SHIVAJIRAO S. JONDHLE COLLEGE OF ENGINEERING & TECHNOLOGY, ASANGAON
NAAC Accredited B++
DEPARTMENT OF ELECTRONICS AND TELECOMMUNICATION ENGINEERING
ACADEMIC YEAR 2019-20

YEAR: TE **SEM: VI** **SCHEME:CBCS**
COURSE OUTCOMES

Learner 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.
		Compose Assembly language and Embedded C program for microcontrollers
2	COMPUTER COMMUNICATION NETWORKS (ECC602)	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.
		Develop knowledge and skills necessary to gain employment as computer network engineer and network administrator.
3	ANTENNA AND RADIO WAVE PROPAGATION (ECC603)	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 planner arrays
		Discuss and analysis of aperture antennas.
		Analysis and apply microstrip antennas
		Analysis of antenna measurements & wave propagation.
4	IMAGE PROCESSING AND MACHINE VISION (ECC604)	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.
		Discuss need of image segmentation for feature extraction.
		Discuss the basics of boundary description and object recognition.
5	DIGITAL VLSI DESIGN (ECCDLO6021)	Explain 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
6	MICROCONTROLLER &APPLICATIONS LAB (ECL601)	Make use of SPJ Simulator to perform different tasks on 8051 microcontroller.
		Make use of MPLAB & Proteus for Microcontroller 8051 Interfacing
7	COMPUTER COMMUNICATION NETWORKS LAB (ECL602)	Discuss network tools and their configuration.
		Construct the configuration of various network devices
		Design the network topology and services eg. Telnet, FTP
		Analyze the topology in NS-2 and configuration of WSN nodes with TCP and UDP
8	ANTENNA AND RADIO WAVE PROPAGATION LAB (ECL603)	Classify different antenna parameters.
		Make use of MATLAB software for different types of antenna
9	IMAGE PROCESSING AND MACHINE VISION LAB (ECL604)	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
NAAC Accredited B++
DEPARTMENT OF ELECTRONICS AND TELECOMMUNICATION ENGINEERING
ACADEMIC YEAR 2019-20

YEAR: BE   **SEM: VII**   **SCHEME:CBCS**
COURSE OUTCOMES

Learner will be able to

SR.NO	SUBJECT	COURSE OUTCOMES
1	MICROWAVE ENGINEERING (ECC701)	Explain the microwaves, transmission lines and design matching networks.
		Differentiate and identify waveguides and microwave components
		State generation and amplification of microwaves
		Identify semiconductor devices
		Assess microwave measurements.
		Explain types of microwave integrated circuits.
2	MOBILE COMMUNICATION (ECC702)	Explain the cellular fundamentals and estimate the coverage and capacity of cellular systems.
		Classify different types of propagation models and analyse the link budget.
		Illustrate the fundamentals and system architecture of GSM, 2.5G and IS-95.
		Apply the concepts of 3G technologies of UMTS and CDMA 2000.
		Elaborate the principles of 3GPP LTE.
		Identify the emerging technologies for upcoming mobile communication systems.
3	OPTICAL COMMUNICATION (ECC703)	Explain fundamentals characteristics of optical fiber communication.
		Explain transmission characteristic of optical fiber.
		List and explain principles and characteristics of various sources of optical fiber.
		List and explain principles and characteristics of various detectors of optical fiber.
		List and explain principles and characteristics of various optical fiber components.
		Calculate parameters for optical link budgeting and analyze the link.
4	INTERNET COMMUNICATION ENGINEERING (ECCDLO7033)	Explain origin and current status of Internet and its services
		Explain Transport Layer protocols and Flow control, error control, congestion control Mechanism
		Classify internetworking routing protocols and there versions
		Explain the concepts of Internet Security system at different layer
		Explain concept of Multimedia Communications technique and standard
		Classify different Integrated and Differentiated Quality of Services (QoS)
5	CYBER SECURITY AND LAWS (ILO 7016)	Understand and recognize the consept of cyber crime and define its aspects of outside world.
		Able to identify and apply IT law in various legal issues
		Analyze and Evaluate different aspects of cyber law
		Evaluate the concept of Cyberspace and Intellectual property aspect.
		Recognize different Indian Act based on cyber security.
		Compile and Apply Information Security Standards during software design and development.

SHIVAJIRAO S. JONDHLE COLLEGE OF ENGINEERING & TECHNOLOGY, ASANGAON
NAAC Accredited B++
DEPARTMENT OF ELECTRONICS AND TELECOMMUNICATION ENGINEERING
ACADEMIC YEAR 2019-20

YEAR: BE **SEM: VII** **SCHEME:CBCS**
COURSE OUTCOMES

Learner will be able to

SR.NO	SUBJECT	COURSE OUTCOMES
6	MICROWAVE ENGINEERING LAB (ECL701)	Explain different components used in lab.
		Measure S-parameters of two port networks
		Demonstrate matching networks using CAD tool
		Show analysis of microstrip lines
		Create matching networks using distributed papameters
		Measure frequency and wavelength using test bench
		Outline VSWR measurement using test bench
		Draw V-I characteristics of GUNN diode.
7	MOBILE COMMUNICATION LAB (ECC702)	Use of AT commands of MHT software to perform different task on MHT hardware
		Use of CDMA Architecture in Mobile Communication System
		Use of GPRS Architecture in Mobile Communication System
8	OPTICAL COMMUNICATION LAB (ECL703)	Demonstration and calculation of numerical aperture.
		Demonstration of signal transmission using different optical sources.
		Demonstration of dispersion and detection of fault using OTDR
		Demonstration of optical multiplexer.
		calculate link power budget.
9	INTERNET COMMUNICATION ENGINEERING (ECLDLO7033)	Create different types of Server on Packet Tracer
		Design a Network and Configure IP related services
		Create and Configure protocol for communication over internet
		Create and Configure protocol for communication over internet
		Create and Configure Network Security System
		Design a Network and Configure IP related services
		Design a Network and Configure IP related services
		Compare the different Protocols using any Simulation Tool

YEAR: BE   **SEM: VIII**   **SCHEME:CBCS**
COURSE OUTCOMES

Learner will be able to

SR.NO	SUBJECT	COURSE OUTCOMES
1	RF DESIGN (ECC801)	Design impedance matching networks and passive RF filters.
		Design and appraise RF amplifier
		Design and characterize RF oscillators and mixers
		Discuss types of frequency synthesizers
		Analyze types of electromagnetic interference in RF circuits
		Discuss types of electromagnetic compatibility in RF circuits
2	WIRELESS NETWORK (ECC802)	Explain the fundamentals, architecture, design issues and standards of wireless networks along with Body Area Network (BAN).
		Describe personal area network (PAN) technologies such as Zigbee, Bluetooth, UWB, RFID, NFC etc.
		Lists different LAN topologies and technologies.
		Illustrate the fundamentals and architecture of wireless Metropolitan Area Networks (WMAN) and describe the phases of planning and design of wireless networks
		Describe various wireless adhoc networks architecture, traffic related protocols and transmission technology.
		Explain basic architecture and working of WSN, WMN and IOT.
3	SATELLITE COMMUNICATION (ECCDLO8043)	Explain the basics of satellite communication and discuss satellite orbital parameter.
		Analyze and design satellites as per various conditions of space
		Discuss earth station configurations.
		Explain and analyzes link budget of satellite signal for proper communication
		Explain space segment access and utilization.
		Discuss the different application of satellite communication
4	ENVIORMENT MANAGEMENT (ILO)	Identify environment, management, systems & organisations in relation to environmental management.
		Demonstrate an integrative approach to environmental issues with a focus on sustainability.
		Explain the concepts of ecology
		Describe the corporate environmental responsibility & environment quality management.
		Identify the role of the IS 14000 series of standard in industry.
		Explain the General overview of major legislations of different types of environmental act.
5	RF DESIGN LAB (ECL801)	To characterize type of RF filter.
		Design passive massive network.
		Demonstrate Smith chart for microwave amplifier design
		Design gain and noise circles for transistor amplifier design.
6	WIRELESS NETWORKS LAB (ECL802)	Make use of NS-2 software to simulate wireless networks.
		Analyze and design wireless network.
		Design and analyze link budget of GSM and CDMA.
7	SATELLITE COMMUNICATION LAB (ECLDLO8043)	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.

SHIVAJIRAO S. JONDHLE COLLEGE OF ENGINEERING & TECHNOLOGY, ASANGAON
NAAC Accredited B++
DEPARTMENT OF COMPUTER ENGINEERING
ACADEMIC YEAR 2019-20

YEAR: SE   **SEM: III**   **SCHEME:CBCS**
COURSE OUTCOMES

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 singnals 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.

SHIVAJIRAO S. JONDHLE COLLEGE OF ENGINEERING & TECHNOLOGY, ASANGAON
NAAC Accredited B++
DEPARTMENT OF COMPUTER ENGINEERING
ACADEMIC YEAR 2019-20

YEAR: SE **SEM: III** **SCHEME:CBCS**
COURSE OUTCOMES

Learner will be able to

SR.NO.	SUBJECT	COURSE OUTCOMES
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.
6	Digital System Lab (CSL301)	Analyze Basic Digital Circuit.
		Analyze truth table of various logic gates using IC's.
		Analyze arithmetic circuits Half adder,Full adder,Half substractor,Full substractor.
7	Basic Electronics Lab (CSL302)	Analyze frequency of oscillation for Colpits oscillator with verification.
		Demonstrate Amplitude Modulation and Demodulation with calculate modulation index.
		Demonstrate generation and detection of Pulse Width Modulation and Demodulation.
8	Data Structure Lab (CSL303)	Analyze running time of basic algorithms for classic problems in various domains.
		Apply operations like traversing mechanism etc. on Various data structures.
		Apply operations like searching, sorting, insertion, deletion, traversing.
		Improve the algorithms using different strategieslike DFS & BFS
9	OOPM Lab (CSL304)	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

SHIVAJIRAO S. JONDHLE COLLEGE OF ENGINEERING & TECHNOLOGY, ASANGAON
NAAC Accredited B++
DEPARTMENT OF COMPUTER ENGINEERING
ACADEMIC YEAR 2019-20

YEAR: SE　　　　　　　　　　　　　　　　**SEM: IV**　　　　　　　　　　　　**SCHEME:CBCS**

COURSE OUTCOMES

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.
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.

SHIVAJIRAO S. JONDHLE COLLEGE OF ENGINEERING & TECHNOLOGY, ASANGAON
NAAC Accredited B++
DEPARTMENT OF COMPUTER ENGINEERING
ACADEMIC YEAR 2019-20

YEAR: SE   **SEM: IV**   **SCHEME:CBCS**
COURSE OUTCOMES

Learner will be able to

SR.NO.	SUBJECT	COURSE OUTCOMES
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, directries 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.

SHIVAJIRAO S. JONDHLE COLLEGE OF ENGINEERING & TECHNOLOGY, ASANGAON
NAAC Accredited B++
DEPARTMENT OF COMPUTER ENGINEERING
ACADEMIC YEAR 2019-20

YEAR: TE　　　　　　　　　　　　　　**SEM:V**　　　　　　　　　　　　**SCHEME:CBCS**

COURSE OUTCOMES

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 procols design while developing in TCP/IP procol suite.
		Demonstrate the strengths and weaknesses of various routing algorithms.
		Analyze transport layer and various application layer procols.
		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 Explaind 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.

SHIVAJIRAO S. JONDHLE COLLEGE OF ENGINEERING & TECHNOLOGY, ASANGAON
NAAC Accredited B++
DEPARTMENT OF COMPUTER ENGINEERING
ACADEMIC YEAR 2019-20

YEAR: TE   **SEM:V**   **SCHEME:CBCS**

COURSE OUTCOMES

Learner will be able to

SR.NO.	SUBJECT	COURSE OUTCOMES
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.
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

SHIVAJIRAO S. JONDHLE COLLEGE OF ENGINEERING & TECHNOLOGY, ASANGAON
NAAC Accredited B++
DEPARTMENT OF COMPUTER ENGINEERING
ACADEMIC YEAR 2019-20

YEAR: TE   **SEM: VI**   **SCHEME:CBCS**

COURSE OUTCOMES

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 crypgraphic 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 Build for management of network

SHIVAJIRAO S. JONDHLE COLLEGE OF ENGINEERING & TECHNOLOGY, ASANGAON
NAAC Accredited B++
DEPARTMENT OF COMPUTER ENGINEERING
ACADEMIC YEAR 2019-20

YEAR: TE   **SEM: VI**   **SCHEME:CBCS**

COURSE OUTCOMES

Learner will be able to

SR.NO.	SUBJECT	COURSE OUTCOMES
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
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 crypgraphy 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.

SHIVAJIRAO S. JONDHLE COLLEGE OF ENGINEERING & TECHNOLOGY, ASANGAON
NAAC Accredited B++
DEPARTMENT OF COMPUTER ENGINEERING
ACADEMIC YEAR 2019-20

YEAR: BE   **SEM: VII**   **SCHEME:CBCS**

COURSE OUTCOMES

Learner will be able to

SR.NO.	SUBJECT	COURSE OUTCOMES
1	Digital Signal & Image Processing(CSC701)	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.
		Develop different DSP Algorithms.
		Analyze different operations and algorithm in image segmentation and image representations.
		Solve the image processing algorithms and techniques in image enhancement.
2	Mobile Communication & Computing(CSC702)	Analyze basic concepts and principles in mobile computing.
		Explain GSM, GPRS system ,mobile services and protocol.
		Analyze Medium Access Control, Mobile TCP,IP.
		Analyze WEP ,WPA, Wireless LAN Threats , Securing Wireless Networks.
		Explain Mobility Management.
		Analyze Long-Term Evolution.
3	Artificial Intelligence & Soft Computing(CSC703)	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	Advance System Security&Digital Forensics (CSDLO7031)	Analyze the concept of Cybercrime.
		Analyze underlying principles of access control mechanisms.
		Analyze Preserving and recovering of digital evidences.
		Analyze different attacks on a network.
		Analyze security management and policies
		Analyze understand and explore techniques used in digital forensics
5	Cyber Security and Laws(ILO7016)	Explain and identify different types cybercrime and cyber law
		Analyze Cyber offenses & Cybercrime.
		Analyze Tools and Methods Used in Cyberline.
		Analyze the Concept of Cyberspace.
		Explain Cyber Crime and Criminal Justice.
		Analyze Information Security Standard compliances.
6	Digital Signal & Image Processing(CSL701)	Analyze Sample and reconstruct the signal
		Analyze and apply operations like Convolution, Correlation, DFT and FFT on DT signals
		Analyze and Implement spatial domain Image enhancement techniques.
7	Mobile App.Devlopment Tech Lab(CSL702)	Demonstrate mobile applications using various tools
		Develop an application that uses GUI components.
		Demontrate an application that draws basic graphical primitives on the screen.
8	Artificial Intelligence & Soft Computing Lab(CSL703)	Explain Hybrid systems and build expert system.
		Explain basics of Neural Networks and Fuzzy Logic.
		Analyze supervised and unsupervised ANN for real world applications.
9	Computational Lab-I(CSL704)	Analyze static code and program vulnerabilities using open source tools.
		Explore and analyze network vulnerabilities using open source tools.
		Explore and analyze different security tools to detect web application and browser vulnerabilities.

SHIVAJIRAO S. JONDHLE COLLEGE OF ENGINEERING & TECHNOLOGY, ASANGAON
NAAC Accredited B++
DEPARTMENT OF COMPUTER ENGINEERING
ACADEMIC YEAR 2019-20

YEAR: BE   **SEM: VIII**   **SCHEME:CBCS**

COURSE OUTCOMES

Learner will be able to

SR.NO.	SUBJECT	COURSE OUTCOMES
1	Human Machine Interaction(CSC801)	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.
2	Distributed Computing(CSC802)	Classify distributed systems, Distributed System Model.
		Analyze Message Oriented Communication, Stream Oriented Communication, Group Communication
		Analyze various Token Based and Non Token based Algorithms
		Analyze and desirable Features of global Scheduling algorithm
		Analyze Consistency, Replication and Fault Tolerance
		Explain Distributed File Systems and Name Services.
3	High Performance Computing(DLO8011)	Analyze Parallel Computing and Classification Models.
		Analyze various Pipeline Performances and Dynamic instruction scheduling.
		Demonstrate Parallel Programming Platforms with Memory System Performances.
		Demonstrate Parallel Algorithm Design
		Analyze Performance Measures : Speedup, execution time, efficiency, cost, scalability,etc
		Analyze Message Passing Interface, Topology and Embedding.
4	Environmental Management (ILO8029)	Analyze and identify environmental issues relevant to India and global concerns
		Analyze Global Environmental concerns.
		Analyze Ecosystems and interdependence between living organisms.
		Analyze Environment Quality Management and Corporate Environmental Responsibility
		Analyze Total Quality Environmental Management.
		Analyze General overview of major legislations.
5	Human Machine Interaction Lab(CSL801)	Demonstration of various interfaces like centric,user friendly,etc.
		Demonstration various application for social task,technical task,etc.
		Demonstrate appropriate icons pertaining to a given domain .
6	Distributed Computing Lab(CSL802)	Demonstrate applications like Client/Server application Using RMI,Multi-threaded application.
		Analyze Inter-Process communication ,Group Communication .
		Analyze various algorithm like Bully Election algorithm,Clock Synchronization algorithm
7	Cloud Computing Lab(CSL803)	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.
8	Computational Lab-II(CSL804)	Analyze MPI platform by various programs.
		Demonstrate balancing of workload on MPI platform
		Demonstrate OpenMP implement parallel programming for calculator application

SHIVAJIRAO S. JONDHLE COLLEGE OF ENGINEERING & TECHNOLOGY, ASANGAON
NAAC Accredited B++
DEPARTMENT OF MECHANICAL ENGINEERING
ACADEMIC YEAR 2019-20

YEAR: SE   **SEM: III**   **SCHEME:CBCGS**
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 momentand 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 playsan 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.
		Dishinguish 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.
6	Machine Shop Practice I MEL304	Demonstrate various machines like lathe, shaper, Milling, Grinding Machine.
		Demonstrate plain turning, taper turning, and screw cutting on lathe machine.
		Demonstrate machining operations on shaper.
		Demonstrate metal joining process like compressive welding.
		Demonstrate forging operations.
		Demonstrate shaping operations.

SHIVAJIRAO S. JONDHLE COLLEGE OF ENGINEERING & TECHNOLOGY, ASANGAON
NAAC Accredited B++
DEPARTMENT OF MECHANICAL ENGINEERING
ACADEMIC YEAR 2019-20

YEAR: SE   **SEM: IV**   **SCHEME:CBCGS**

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.
6	Machine Shop Practice II MEL405	Demonstrate lathe machine,
		Demonstrate shaping operations.
		Demonstrate finishing operations on grinding machine.
		Demonstrate milling operations.
		Demonstrate precision turning.
		Demonstrate drilling and threading operations

SHIVAJIRAO S. JONDHLE COLLEGE OF ENGINEERING & TECHNOLOGY, ASANGAON
NAAC Accredited B++
DEPARTMENT OF MECHANICAL ENGINEERING
ACADEMIC YEAR 2019-20

YEAR: TE   **SEM: V**   **SCHEME:CBCGS**

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.
		Illustratevibration 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 working of systems and processes of S I and CI Engine
		Demonstrate the lubrication, fuel and ignition system SI and CI engines
		Analyze the Engine performance
		Illustrate the emission and how to control in Engine
		Demonstrate the electronic controls
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
NAAC Accredited B++
DEPARTMENT OF MECHANICAL ENGINEERING
ACADEMIC YEAR 2019-20

YEAR: TE   **SEM: VI**   **SCHEME:CBCGS**

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.

SHIVAJIRAO S. JONDHLE COLLEGE OF ENGINEERING & TECHNOLOGY, ASANGAON
NAAC Accredited B++
DEPARTMENT OF MECHANICAL ENGINEERING
ACADEMIC YEAR 2019-20

YEAR: BE   **SEM: VII**   **SCHEME:CBCGS**
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.
		Explain transform manipulate objects store and manage data.
3	Automobile Engineering MEDLO7032	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.
4	Production Planning and Control MEC703	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.
		Create a logical approach to Line Balancing in various production systems.
		Build techniques of manufacturing planning and control.
5	Product Lifecycle Management ILO7011	Gain knowledge about phases of PLM, PLM strategies and methodology for PLM feasibility study and PDM implementation.
		Illustrate various approaches and techniques for designing and developing products.
		Apply product engineering guidelines / thumb rules in designing products for moulding, machining, sheet metal working etc.
		Acquire knowledge in applying virtual product development tools for components, machining and manufacturing plant

SHIVAJIRAO S. JONDHLE COLLEGE OF ENGINEERING & TECHNOLOGY, ASANGAON
NAAC Accredited B++
DEPARTMENT OF MECHANICAL ENGINEERING
ACADEMIC YEAR 2019-20

YEAR: BE   **SEM: VIII**   **SCHEME:CBCGS**

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	Power Engineering MEC803	Compute heat interactions in combustion of reactive mixtures
		Differentiate boilers, boiler mountings and accessories
		Calculate boiler efficiency and assess boiler performance
		Demonstrare working cycles ofgas turbines
		Draw velocity triangles of impulse/reaction turbines and calculate performance parameters/efficiency
		Demonstrate basic working of pumps
3	Power Plant Engineering MEDLO8041	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.
4	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..
		Explian Agile manufacturing, flexible manufacturing and lean Manufacturing
5	Environmental Management ILO8029	Identify environment, management, systems & organisations in relation to environmental management.
		Demonstrate an integrative approach to environmental issues with a focus on sustainability.
		Understand concepts of ecology
		Understand corporate environmental responsibility & environment quality management.
		Identify the role of the IS 14000 series of standard in industry.
		General overview of major legislations of different types of environmental act
6	Renewable Energy Sources MEDLO8043	Define the need of different renewable energy sources
		Illustrate importance of renewable energy sources
		Explian various renewable energy sourses in Indian context
		Simply and find utilization of solar and wind energy
		Analyse the design of bio gas
		Explain basics of hydrogen energy

SHIVAJIRAO S. JONDHLE COLLEGE OF ENGINEERING & TECHNOLOGY, ASANGAON
NAAC Accredited B++
DEPARTMENT OF MECHANICAL ENGINEERING
ACADEMIC YEAR 2019-20

YEAR: ME **SEM: I** **SCHEME:CBCGS**

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 evalution 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 Hydroectric 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 ofsolar energy systems.
5	Energy audit and management (ILO1018)	Identify and describe present state of energy security and its importance.
		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.

SHIVAJIRAO S. JONDHLE COLLEGE OF ENGINEERING & TECHNOLOGY, ASANGAON
NAAC Accredited B++
DEPARTMENT OF MECHANICAL ENGINEERING
ACADEMIC YEAR 2019-20

YEAR: ME　　　　　　　　**SEM: II**　　　　　　　　**SCHEME:CBCGS**

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.

SHIVAJIRAO S. JONDHLE COLLEGE OF ENGINEERING & TECHNOLOGY, ASANGAON
NAAC Accredited B++
DEPARTMENT OF CIVIL ENGINEERING
ACADEMIC YEAR 2019-20

YEAR: SE   **SEM: III**   **SCHEME:CBCS**
COURSE OUTCOMES

Learner will be able to

SR.NO	SUBJECT	COURSE OUTCOMES
1	Applied Mathematics - III	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
		Fit the curve using concept of correlation and regression.
		Apply bilinear transformations and conformal mappings
		Identify the applicability of theorems and evaluate the contour integrals
2	Surveying - I	Explain basic principles of surveying, surveying measurement and errors.
		Use modern survey equipment to measure angles and distances.
		Measure differences in elevation, draw and utilize contour plots, and calculate volumes for earthwork
		Perfom the assigned field work.
		Perform Theodolite, temporary adjustments, different methods of Theodolite traversing & error in Theodolite traversing.
		Explain suitability of tacheometry and perform different methods of tacheometry, stadia formula, stadia diagram & tables.
3	Strength of Materials (SOM)	Analyze the flexural members for its structural behaviour under the effect of flexure (bending), shear & torsion either indepenently 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 & axial force diagrams
		Evaluate the deformation behaviour of axially loaded columns considering wind load (chimneys, dams etc.) & behaviour of direct & bending stresses with various safety conditions
		Explain the behaviour of the structural members under the action of axial load , bending & twisting moment
		Synthesize the deformation behaviour of axially loaded columns having different end condtions & further evaluate the strength of such columns
		Determine engineering properties for metals & non- metals
4	Engineering Geology	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
		Describe 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.
5	Fluid Mechnics-I	Define the fluid properties & basic fundamental concepts along with identification of fluids types with relevance in civil engineering
		Explain the various hydrostatic fundamentals like Pascal's laws, hydrostatic law, buoyancy principle & them distinguish role in civil engineering
		Illustrate the fluid kinematics & interpret ate their methodology towards engineering needs
		Expalin the Bernoulli's equation & its role in civil engineering
		Examine the role of various flow measuring devices & employ them in engineering practices & projects
		Choose the appropriate equipments as per engineering need & compare various devices accordingly

SHIVAJIRAO S. JONDHLE COLLEGE OF ENGINEERING & TECHNOLOGY, ASANGAON
NAAC Accredited B++
DEPARTMENT OF CIVIL ENGINEERING
ACADEMIC YEAR 2019-20

YEAR: SE   **SEM: IV**   **SCHEME:CBCS**
COURSE OUTCOMES

Learner will be able to

SR.NO	SUBJECT	COURSE OUTCOMES
1	Applied Mathematics - IV	Solve the system of linear equations using matrix algebra with its specific rules.
		Illustrate 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	Surveying - II	Quantify the safety performance of horizontal curves on two-way,two-lane rural roads relative to tangent segments.
		Design Vertical curve for a transition for the intended design speed for roadway.
		Establish grids of levels over a site and use them to establish contours and carry out volumn calculations.
		Measure slope distance, vertical angle, and horizontal angle from total station.
		Determining & defining land ownership and boundaries
		explain survey terminologies like tehsildar, 7/12, utara, namuna8, Survey of India Department; Department of Registration and Stamps,
3	Structural Analysis - I	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
		Obtain the response of the beams & trusses under rolling loads & subsequently to obtain absolute max. bending moment
		Analyse the structures such as arches & suspensions bridges & three hinged stiffening girders
		Explain unsymmetrical bending & shear center & apply in solving the problems of structural mechanics
4	Buildding Design and Drawing (BDD)	Explain various provisions of IS CODE and NATIONAL BUILDING CODE regarding planning, permissions and relate byelaws.
		Describe 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.
		Describe planning of green buildings and analyze certification methods.
		Prepare computer aided drawing (cad) using any one available software.
5	Fluid Mechnics-II	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
		Establish Reynold's equation & classify types of flow
		Evaluate pressure drop in pipe flow by applying Hagen – Poiseuille's equation
6	Building Material and Construction Technlogy	Explain different types of building materials and their requirements.
		Describe the manufacturing Process and Properties of Basic Construction Materials and explain Damp -proofing and water proofing materials
		Explain manufacturing process and properties of concrete. Describe laboratory tests. Explain Admixtures, their tests and chemistry and compatibility with concrete
		Describe manufacture, properties and applications of glass fibre reinforced plastic, Timber (wood).
		Design Concrete mix by I.S. method. Explain manufacture process of Ready mix concrete.
		Describe Masonry Construction and Masonry Finishes and Described the different types of floor and roofs coverings & different types of Formwork Materials used and design considerations.

SHIVAJIRAO S. JONDHLE COLLEGE OF ENGINEERING & TECHNOLOGY, ASANGAON
NAAC Accredited B++
DEPARTMENT OF CIVIL ENGINEERING
ACADEMIC YEAR 2019-20

YEAR: TE   **SEM: V**   **SCHEME:CBCS**

COURSE OUTCOMES

Learner will be able to

SR.NO	SUBJECT	COURSE OUTCOMES
1	Structural Analysis - II	Explain the behavior of various statically indeterminate structures.
		Explain two hinged arches and draw SFD , BMD for various loading conditions.
		Analyze various structures and find out the internal forces.
		Further, the students shall be able to extend the knowledge gained in this subject.
		Explain application of structural engineering mechanics in the higher years of their UG programme.
		The knowledge gained in this subject shall be useful for application in the structural design in later years.
2	Geotechnical Engginering-I	Analyse stability of slopes and soft rocks.
		Explain the behavior and strength of the soil such as earth retaining, rigit retaining wall.
		Identify different types of shallow foundations and establish the most economical design of structures.
		Explain the effect of dynamic interaction between pile-foundations & soil on strength demand spectra
		expalin fibre reinforced soil and its strength variation
		Investigate effects of foundation stiffness on failure mechanisms & strength of foundation soil.
3	Applied Hydrolics	Apply the momentum principle to pipe bend problems & moment of momentum equation to sprinklers
		Demonstrate the model laws to real life devices
		Understand the mechanism of impact of jets on stationary & moving objects
		Solve the problems related to hydraulic turbines
		Understand the phenomenons invoved in centrifugal pumps
		Demonstrate the principles, mechanims & working of various hydraulic machines such as ram, press, accumulator, intensifier , cranes & lift
4	Transportation Engginering - I	Explain planning requirements of different types of highways. Conduct surveys and prepare report
		Calculate geometric design elements of highways
		Conduct traffic study. Explain traffic control devices and Intersections
		Explain materials used for highway construction. Explain soil stabilization and geosynthetics
		Explain pavement design of various pavements. Explain IRC requirements for pavement design
		Explain construction of different types of roads. Investigate failure of pavements and suggest strengthening measures. Explain highway drainage
5	Environmental Engineering-I	Explain the planning, design and construction of water systems
		Aanalyze the quality of water and will be able to conduct the quality control test on samples.
		Explain the different processes in the water treatment facility.
		Design the different units of treatment for water treatment plants.
		Explain the components of building water supply system, storage and rain water harvesting.
		Understand the problems of air and noise pollution and contribute practical solutions to environmental problems in our society.
6	DLOC-Building Services & Repairs	Compare the best utility services and installation.
		Differentiate and execute different plumbing systems.
		Generate 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.
		Conduct survey of structural concrete & Rebars, suggest its protection techniques
7	DLOC-Advance concrete Technology	Identify various types of material and properties in concrete.
		Define the various properties of special concrete
		understand the mix design by different methods
		explain use of fiber reinforced concrete.
		Explain the different procedures for concrete testing
		Provide guidance of the concept of durability and cracking in concrete.

SHIVAJIRAO S. JONDHLE COLLEGE OF ENGINEERING & TECHNOLOGY, ASANGAON
NAAC Accredited B++
DEPARTMENT OF CIVIL ENGINEERING
ACADEMIC YEAR 2019-20

YEAR: TE   **SEM: VI**   **SCHEME:CBCS**
COURSE OUTCOMES

Learner will be able to

SR.NO	SUBJECT	COURSE OUTCOMES
1	Geotechnical Engginering-II	Evaluate the consolidation parameters for the soil.
		Calculate the shear strength parameters for the soil.
		Calculate the factors of safety of different types of slopes under various soil conditions, analyze the stability of slopes, calculate lateral earth pressures and analyse the stability of retaining walls.
		Analyse bearing capacity of shallow foundations using theoretical and field methods, calculate load bearing capacity of pile foundations
		Explain conduits and calculate the load carried by the struts of a braced cut under various soil conditions.
		Explain ground improvement techniques.
2	Design and Drwing of Steel Sturcture	Explain advantages of steel members, LSM design philosophy for design of steel members.
		Analyse and design tension and compression member,
		Analyse and design laterally supported and laterally unsupported beam,
		Analyse and design column and column base
		Calculate loading on truss and design truss.
		Independently design steel structures using relevant IS codes
3	Water Resource Engg.-I	Discuss various types of irrigation projects
		Explain different irrigation method and effective use of water resources.
		Analyse the crop water requirement and irrigation requirement
		Derive hydrographs and evalute runoff of a catchment area.
		Describe the steady and unsteady state conditions of any aquifer and water wells.
		Analyse the capcity of reservoir for different purposes.
4	Transportation Engginering - II	Explain different transportation systems in Society.
		Explain different transportation systems and their planning
		Explain planning, construction and maintenance of Railway tracks.
		Explain planning, construction and different types of airports.
		Explain in deatiled the maintenance of airports.
		Describe Water Transportation system in details and its facilities & including harbors docks, port facilities.
5	Environmental Engineering-II	Evaluate the role of sanitation in the urban water cycle, its relation to public health and environment
		Analysis of characteristics of sewage treatment process
		Analysis of biological processes and their mutual relationships within various sanitation components
		Explain the treatment, Reclamation and resource recovery and re-use at both centralized and decentralized levels
		Evaluate the characteristics of sludge and its disposal of drying beds.
		Explain Environmental pollution its occupational hazards.
6	DLOC -Advance construction equipment	Explain the use/applications of various conventional construction equipment and select the best out of them for a particular site requirement.
		Explain modern methods used for underground as well as underwater tunnelling.
		Differentiate conventional and modern methods of formwork on the basis of productivity,reuse value,ease of erection and dismantling,flexibility offered and overall cost**.**
		Explain techniques and equipment required for construction of various transporting facilities.
		Explain about the setting up ofdifferent kinds of the power generating structures.
		select proper equpiment for construction of transporting facilities based on requirements.
7	DLOC -Ground Improvement Technique	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.
		Analyse grouting for various engineering applications in field.
		Analyse stone column layout
		Analyse the geotechnical structres with the pseudo-static method under seismic condition.

SHIVAJIRAO S. JONDHLE COLLEGE OF ENGINEERING & TECHNOLOGY, ASANGAON
NAAC Accredited B++
DEPARTMENT OF CIVIL ENGINEERING
ACADEMIC YEAR 2019-20

YEAR: BE   **SEM: VII**   **SCHEME:CBCS**
COURSE OUTCOMES

Learner will be able to

SR.NO	SUBJECT	COURSE OUTCOMES
1	Theory Of Reinforced concrete structures(TRCS)	Explain concept and problems on WSM And LSM
		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 (QSEV)	To read and interpret plans, sections, detailed drawings and specifications, calculate quantities of various items and prepare estimate a construction project.
		Prepare bar bending schedules and draw mass haul diagrams
		Calculate the market rates of basic materials Review the current market rates for labour and material required for construction, perform rate analysis and compare with DSR
		Draft the specifications for various items required for construction.
		Draft tenders, prepare valid contract documents.
		Explain different terms related to valuation and conduct valuation of property
3	Water Resource Engg.-II(WRE-II)	Design the section of gravity dams,
		Explain various types of earth and rockfill dams.
		Apply silt theories to design irrigation canals.
		Apply silt theories to design irrigation canals.
		Explain various types of canals and its maintenance.
		Explain different cross drainage works of a canal system.
4	Dept. level Elective - III Solid Waste Management (SWM)	Explain generation, storage, collection transfer and transport, recovery, and disposal in the management of solid waste.
		Understand the characteristics of different types of solid waste and the factors affecting variation.
		Identify the method of collection, storage and transportation of solid waste.
		Suggest suitable technical solutions for processing of waste.
		Ability to plan waste minimization and disposal of municipal solid waste.
		Ensure the safe handling and treatment of Hazardous, Electronic and Bio medical waste.
5	Inst.level Elective - I Disaster Management & Mitigation Measures	Understand the disaster phenomenon, its different contextual aspects.
		Explain the types of disasters, samples and distribution of disaster in the world and in India.
		Understand the disaster management policy and diaster risks in india.
		Explain public awareness, emergency management & avoid disasters.
		Identify damaging capacity of a disasters.
		Explain the concepts of prevention measures mitigation measures, community disaster volunteers and business continuity.

SHIVAJIRAO S. JONDHLE COLLEGE OF ENGINEERING & TECHNOLOGY, ASANGAON
NAAC Accredited B++
DEPARTMENT OF CIVIL ENGINEERING
ACADEMIC YEAR 2019-20

YEAR: BE **SEM: VIII** **SCHEME:CBCS**
COURSE OUTCOMES

Learner will be able to

SR.NO	SUBJECT	COURSE OUTCOMES
1	Design and Drwing of reinforced concrete structure (DDRCS)	Understand the complete analysis and design of public building using relevant IS codes.
		Analyze and Design of different types of Staircase.
		Interpret the complete analysis and design different types of retaining wall by Limit state method.
		Design Different Types of water Tank.
		Explain response of structure during an earthquake and calculate design forces.
		Explain principle of PSC and calculate losses .
2	Construction Management (CM)	To understand the mnanagement functions like planning, scheduling, executing & controlling the construction projects.
		Explain the roles and responibilities of various angencies involved in construction project.
		Apply the knowledge of management functions like planning, scheduling, executing and controlling to construction projects.
		Demonstrate their capability for preparing the project networks to work out best possible time for completing the project.
		Exercise the optimum time- cost relationship for construction projects.
		Implement the safety aspects during the execution of civil engineering project & quality aspects during the execution of civil engineering project
3	Dept. level Elective -IV Industrial Waste Treatment	Understand the characteristics of industrial wastewater
		Identify sampling method and analyze industrial waste
		Design facilities for the processing and reclamation of industrial waste water.
		Explain on-site treatment methods and solve Analyze and design wastewater treatment systems.
		Detailed on-site manufacturing processes and treatments of industrial waste water.
		Analyze proposed development project plans for possible environmental effects and to improve treated effluent quality to confirm standard prescribed by regulatory agencies.
4	Inst.level Elective - II Environment Management	Identify environment, management, systems & organisations in relation to environmental management.
		Demonstrate an integrative approach to environmental issues with a focus on sustainability.
		Understand concepts of ecology
		Understand corporate environmental responsibility & environment quality management.
		Identify the role of the IS 14000 series of standard in industry.
		General overview of major legislations of different types of environmental act

SHIVAJIRAO S. JONDHLE COLLEGE OF ENGINEERING & TECHNOLOGY, ASANGAON
NAAC Accredited B++
DEPARTMENT OF CIVIL ENGINEERING
ACADEMIC YEAR 2019-20

YEAR: PG(FE)   **SEM: I**   **SCHEME:CBCS**
COURSE OUTCOMES

Learner will be able to

SR.NO	SUBJECT	COURSE OUTCOMES
1	Probability and Statistics	Explain 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	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	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 injuctions, indemnity and guarantee
4	Repairs, Rehabilitation & Retrofitting of Structures	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, interprete the data and draw conclusions.
		Compare various Repair Materials and their selection, essential parameters
		Analyze different Repair/ Rehabilitation Techniques for materials, procedures advantages etc.
		Prepare Guidelines for Repair and Rehabilitation Work and Post repair inspection and maintainace.
		Explain Seismic retrofitting and Maintenance of Heritage Structures
		Analyze Repair of water retaining structures, hydraulic structures, Pavements and Runways, bridges, sewage treatment plants Tunnels, industrial structures- Specialized repairs for chemical disruption, fire, marine exposure etc.
5	Disaster Management and Mitigation Measures	State 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.

SHIVAJIRAO S. JONDHLE COLLEGE OF ENGINEERING & TECHNOLOGY, ASANGAON
NAAC Accredited B++
DEPARTMENT OF CIVIL ENGINEERING
ACADEMIC YEAR 2019-20

YEAR: PG(FE)　　　　　　　　**SEM: II**　　　　　　　**SCHEME:CBCS**
COURSE OUTCOMES

Learner will be able to

SR.NO	SUBJECT	COURSE OUTCOMES
1	Advanced Construction Technology	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.
		Describe construction of transporting facilities like Roads and Bridges, Railways and Ports.
		Prepare action plan for the various construction activities for Power Generating Structures.
		Prepare action plan for Hydro power station, Atomic power Stations, Thermal power station, Windmills, Solar Power, transmission towers.
2	Infrastructure Development	Describe 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.
		Describe 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	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
		Calculate 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.
		Perform 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	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.
		Prepare 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.
		Describe 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 Methodoly	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.
		Describe and 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

SHIVAJIRAO S. JONDHLE COLLEGE OF ENGINEERING & TECHNOLOGY, ASANGAON
NAAC Accredited B++
DEPARTMENT OF FIRST YEAR ENGINEERING
ACADEMIC YEAR 2019-20

YEAR: FE **SEM: I** **SCHEME:C**

Learner will be able to

SR.NO	SUBJECT	COURSE OUTCOMES
1	ENGINEERING MATHMATICS-I (FEC101)	Apply the basic concept of complex numbers and will be able to use it for engineering programs
		Apply hyperbolic functions and logarithms in the subject like electrical circuit.
		Apply the basic concept of partial differentiation of functions of several variables and will be able to use in subjects like electromagnetic theory.
		Apply the concept of maxims ,minima and successive will be able to use it for optimization and tuning the systems.
		Apply the concept of matrices and will be able to use it for solving engineering programs.
		Apply the concept of numerical methods for solving the engineering programs with the help of scilab software.
2	ENGINEERING PHYSICS-I(FEC102)	Illustrate the fundamentals of Quantum Mechanics & apply the knowledge of Quantum Mechanics to uncertainty principle & motion of free particle.
		Illustrate the knowledge of crystal planes, X- ray diffraction & use XRD technique to determine crystal structure.
		Illustrate the knowledge of Fermi level in semiconductors & applications of semiconductors in electronic devices.
		Illustrate the knowledge of interference in thin films & use this knowledge to Antireflecting & Highly reflecting film.
		Illustrate the basic knowledge of superconductors & supercapacitors.
		Illustrate the knowledge of engineering materials like multiferroics & applications
3	ENGINEERING CHEMISTRY-I (FEC103)	Explain the concept of atomic and molecular orbital theory and relate it to diatomic molecule.
		Describe the concept of aromaticity and interpret it with relation to specific aromatic systems
		Explain the various types of intermolecular forces and relate it to real gases.
		Understand thermodynamics in studying different chemical systems in equilibrium obeying Gibb's phase rule.
		Describe chemistry of polymers; apply knowledge of various polymers in their classification synthesis, properties and uses along with their compounding and fabrication techniques.
		Describe types of hardness of water and its estimation & Calculate percentage of impurities in water, apply the knowledge of various softening and disinfecting methods.
4	ENGINEERING MECHANICS (FEC104)	Illustrate the concept of force, moment and apply the same along with the concept of equilibrium in two and three dimensional systems with the help of FBD.
		Demonstrate the understanding of Centroid and its significance and locate the same.
		Correlate real life application to specific type of friction and estimate required force to overcome friction.
		Establish relation between velocity and acceleration of a particle and analyze the motion by plotting the relation
		Illustrate different types of motions and establish Kinematic relations for a rigid body
		Analyze particles in motion using force and acceleration, work-energy and impulsemomentum principles
5	BASIC ELECTRICAL ENGINEERING (FEC105)	Apply various network theorems to determine the circuit response / behaviour.
		Evaluate and analyse 1-Φ circuits.
		Evaluate and analyse 3-Φ AC circuits.
		Explain the constructional features and operation of 1-Φ transformer.
		Illustrate the working principle of 3-Φ machine.
		Illustrate the working principle of 1-Φ machines.
6	ENGINEERING PHYSICS-I(FEL101)	Perform the experiment based on interference in thin film & analyse the result.
		Verify the theory learned in module Crystallography.
		Perform the experiment on Hall effect & determine Hall coefficient.
		Perform the experiment on junction diode & analyse I/V charecteristics of diode.
		Perform the experiment on Zener diode & analyse its use.

SHIVAJIRAO S. JONDHLE COLLEGE OF ENGINEERING & TECHNOLOGY, ASANGAON

NAAC Accredited B++

DEPARTMENT OF FIRST YEAR ENGINEERING

ACADEMIC YEAR 2019-20

YEAR: FE   **SEM: I**   **SCHEME:C**

Learner will be able to

SR.NO	SUBJECT	COURSE OUTCOMES
7	ENGINEERING CHEMISTRY-I (FEL102)	Demonstrate Chloride content and hardness of water sample
		Demonstrate free acid ph of different solutions
		Demonstrate metal ion concentration,
		Synthesize polymers, biodegradable plastics.
		Demonstrate Viscosity of oil
8	ENGINEERING MECHANICS (FEL103)	Illustrate the concept of force, moment and apply the same along with the concept of equilibrium in two and three dimensional systems with the help of FBD.
		Demonstrate the understanding of Centroid and its significance and locate the same.
		Correlate real life application to specific type of friction and estimate required force to overcome friction.
		Establish relation between velocity and acceleration of a particle and analyze the motion by plotting the relation
		Illustrate different types of motions and establish Kinematic relations for a rigid body
		Analyze particles in motion using force and acceleration, work-energy and impulse momentum principles
9	BASIC ELECTRICAL ENGINEERING (FEL104)	Determine and analyse the behaviour of DC circuits using network theorems.
		Perform and infer experiment on single phase AC circuits.
		Demonstrate experiment on three phase AC circuits.
		Illustrate the performance of single phase transformer
		Illustrate the performance of D C Machines.
10	WORKSHOP PRACTICS-I(FEL105)	Develop the necessary skill required to handle/use different fitting tools.
		Develop skill required for hardware maintenance.
		Able to install an operating system and system drives.
		Able to identify the network components and perform basic networking and crimping.
		Able to prepare the edges of jobs and do simple arc welding.
		Develop the necessary skill required to handle/use different plumping tools.
		Demonstrate the turning operation with the help of a simple job

SHIVAJIRAO S. JONDHLE COLLEGE OF ENGINEERING & TECHNOLOGY, ASANGAON
NAAC Accredited B++
DEPARTMENT OF FIRST YEAR ENGINEERING
ACADEMIC YEAR 2019-20

YEAR: FE   **SEM: II**   **SCHEME:C**

Learner will be able to

SR.NO	SUBJECT	COURSE OUTCOMES
1	ENGINEERING MATHMATICS-II (FEC201)	Apply the basic concept of first order and first degree differential equation to the problems in the field of engineering.
		Apply the concepts of higher order linear differential equation to the engineering programs.
		Apply the concept of beta and gamma function to solve improper integrals.
		Apply the concept of double integral of different coordinate systems to the engineering programs like area and mass.
		Apply the concept of triple integral of different coordinate systems to the engineering programs and problems based on volume of solids.
		Solve differential equations and integratios numerically using scilab software to experimental aspects of Engineering mathematics.
2	ENGINEERING PHYSICS-II(FEC202)	Describe the diffraction through slits and its applications.
		Apply the foundation of laser and fiber optics in development of modern communication technology.
		Relate the basics of electrodynamics which is prerequisite for satellite communications, antenna theory etc.
		Explain the fundamentals of relativity.
		Assimilate the wide scope of nanotechnology in modern developments and its role in emerging innovating applications.
		Interpret and explore basic sensing techniques for physical measurements in modern instrumentations
3	ENGINEERING CHEMISTRY-II (FEC203)	Describe the ranges of the electromagnetic spectrum used for exciting different molecular energy levels in various spectroscopic techniques.
		Explain the concept of emission spectroscopy and describe the phenomena of
		fluorescence and phosphorescence in relation to it
		Explain the concept of electrode potential and nernst theory and relate it to electrochemical
		cells.
		Describe Types of Corrosion, Factors affecting the rate of corrosion, Proper designing, Use of inhibitors,
		Describe Twelve Principles of Green chemistry, numerical on atom economy, Conventional and green synthesis
		Apply classification of fuels-solid, liquid and gaseous., Cracking- Definition, Types of cracking, Combustion
4	ENGINEERING GRAPHICS (FEC204)	Apply the basic principles of projections in Projection of Lines and Planes
		Apply the basic principles of projections in Projection of Solids.
		Apply the basic principles of sectional views in Section of solids.
		Apply the basic principles of projections in converting 3D view to 2D drawing.
		Read a given drawing.
		Visualize an object from the given two views.
5	C PROGRAMMING (FEC205)	Illustrate the concept of force, moment and apply the same along with the concept of equilibrium in two and three dimensional systems with the help of FBD.
		Demonstrate the understanding of Centroid and its significance and locate the same.
		Correlate real life application to specific type of friction and estimate required force to overcome friction.
		Establish relation between velocity and acceleration of a particle and analyze the motion by plotting the relation
		Illustrate different types of motions and establish Kinematic relations for a rigid body
		Analyze particles in motion using force and acceleration, work-energy and impulsemomentum principles

SHIVAJIRAO S. JONDHLE COLLEGE OF ENGINEERING & TECHNOLOGY, ASANGAON
NAAC Accredited B++
DEPARTMENT OF FIRST YEAR ENGINEERING
ACADEMIC YEAR 2019-20

YEAR: FE　　　　　　　　　　　**SEM: II**　　　　　　　　**SCHEME:C**

Learner will be able to

SR.NO	SUBJECT	COURSE OUTCOMES
6	PROFESSIONAL COMMUNICATION AND ETHICS- I (FEC206)	Eliminate barriers and use verbal/non-verbal cues at social and workplace situations.
		Employ listening strategies to comprehend wide-ranging vocabulary, grammatical structures, tone and pronunciation
		Prepare effectively for speaking at social, academic and business situations.
		Use reading strategies for faster comprehension, summarization and evaluation of texts
		Acquire effective writing skills for drafting academic, business and technical documents
		Successfully interact in all kinds of settings, displaying refined grooming and social skills.
7	ENGINEERING PHYSICS-II(FEL201)	Perform the experiments based on diffraction through slits using Hg source and analyze the results.
		Perform the experiments based on diffraction through slits using Laser source and analyze the results.
		Perform the experiments based on diffraction through slits using Laser source and analyze the results.
		Perform the experiments based on diffraction through slits using Laser source and analyze the results.
		Perform the experiments using optical fibre to measure numerical aperture of a given fibre.
		Perform the experiments on ultrasonic transducer for distance measurement and analyze the result.
8	ENGINEERING CHEMISTRY-II (FEL202)	Demonstrate moisture and ash content of coal
		Demonstrate saponification and acid value of oil
		Demonstrate flash point of a lubricating oil
		Synthesize a drug and a biofuel.
9	ENGINEERING GRAPHICS (FEL203)	Make use of command to draw 2D drawing using software.
		Apply to convert given 3D into 2D views using tools in software
		Apply convert given 2D into 3D drawing using software
10	C-PROGRAMMING (FEC204)	Translate given algorithms to a program..
		Correct syntax and logical errors
		Write iterative as well as recursive programs.
		Represent data in arrays, strings and structures and manipulate them through a program.
		Declare pointers and demonstrate call by reference concept
11	PROFESSIONAL COMMUNICATION AND ETHICS- I (FEL205)	Listen and comprehend all types of spoken discourse successfully.
		Speak fluently and make effective professional presentations.
		Read large quantities of text in a short time to comprehend, summarise and evaluate
		Content.
		Draft precise business letters, academic essays and technical guidelines.
		Dress finely and conduct themselves with panache in social, academic and professional situations.
12	WORKSHOP PRACTICES-II(FEL206)	Develop the necessary skill required to handle/use different carpentry tools.
		Identify and understand the safe practices to adopt in electrical environment.
		Demonstrate the wiring practices for the connection of simple electrical load/ equipment.
		Design, fabricate and assemble pcb.
		Develop the necessary skill required to handle/use different masons' tools.
		Develop the necessary skill required to use different sheet metal and brazing tools.
		Able to demonstrate the operation, forging with the help of a simple job.