SVERI's COLLEGE OF ENGINEERING, PANDHARPUR

Engineering for Excellence

PROGRAMME OUTCOMES AND COURSE OUTCOMES

PROGRAMME OUTCOMES

DEPARTMENT OF CIVIL ENGINEERING

Engineering Graduates will be able to:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
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. **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. **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. **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. **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. **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. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
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. **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. **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.

DEPARTMENT OF CIVIL ENGINEERING

SECOND YEAR (2021-22)

SEMESTER-I

Course Name & Code	Course Outcomes	Bloom's Level
COURSE: SURVEYING & GEOMATICS (CE31C)	UNDERSTAND THE TEMPORARY ADJUSTMENTS OF MODERN SURVEYING EQUIPMENTS AND THE ATTRIBUTES OF LEADERSHIP, WORKING IN THE TEAM AND PROFESSIONAL ETHICS WHILE PERFORMING THE SURVEYING PROJECTS.	BL2 UNDERSTAND
	EXPERIMENT WITH THE SURVEYING INSTRUMENTS SUCH AS THEODOLITE FOR MEASUREMENTS OF HORIZONTAL/ VERTICAL/INCLINED DISTANCE, HORIZONTAL/ VERTICAL ANGLES AND BEARINGS	BL3 APPLY
	ILLUSTRATE THE USE OF THE SURVEYING INSTRUMENTS NAMELY LEVELS EDM, TOTAL STATION FOR SURVEYING MEASUREMENTS SUCH AS HORIZONTAL/ VERTICAL/INCLINED DISTANCE, HORIZONTAL/ VERTICAL ANGLES, BEARINGS, REDUCED LEVELS, AND COORDINATES	BL3 APPLY
	USE THE INFORMATION OF MODERN SURVEYING TECHNIQUES NAMELY GLOBAL POSITIONING SYSTEM FOR CIVIL ENGINEERING APPLICATIONS.	BL3 APPLY
	USE THE MODERN SURVEYING TECHNIQUES NAMELY REMOTE SENSING FOR CIVIL ENGINEERING APPLICATIONS.	BL3 APPLY
	DETERMINE THE USE OF MODERN SURVEYING TECHNIQUES LIKE GEOGRAPHIC INFORMATION SYSTEM FOR CIVIL ENGINEERING APPLICATIONS SUCH AS DEVELOP PLANS, DRAW MAPS AND DRAFT REPORTS FOR SURVEYING PROJECTS OF CIVIL ENGINEERING WORKS	BL3 APPLY
COURSE: FLUID MECHANICS AND FLUID MACHINES (CE32C)	COMPREHEND TECHNICAL PROPERTIES OF FLUIDS, CONCEPT OF SUBMERGED & FLOATING STRUCTURES IN A STATIC FLUID.	BL2 UNDERSTAND
	APPLY KINEMATICS AND DYNAMICS OF FLOW FOR SOLVING CIVIL ENGINEERING PROBLEMS.	BL3 APPLY
	QUANTIFY WATER FLOW THROUGH WEIRS, NOTCHES, VENTURIMETER, ORIFICE, AND PITOT TUBE.	BL3 APPLY
	DETERMINE PIPE LOSSES AND SOLVE PIPE NETWORKS.	BL3 APPLY
	PREDICT PHYSICAL PARAMETERS THAT INFLUENCE THE FLOW IN FLUID MECHANICS USING DIMENSIONAL ANALYSIS.	BL3 APPLY
	EXPLAIN THE WORKING OF PELTON, FRANCIS AND KAPLAN TURBINES AND PUMPS ALONG THEIR PERFORMANCE PARAMETERS.	BL2 UNDERSTAND
	UNDERSTAND PROPERTIES AND ROLE OF INGREDIENTS LIKES CEMENT, AGGREGATE ETC. TO PRODUCE BETTER QUALITY CONCRETE.	BL2 UNDERSTAND

COURSE: CONCRETE TECHNOLOGY, MATERIAL TESTING & EVALUATION (CE33C)	DEMONSTRATE LABORATORY TESTING OF VARIOUS INGREDIENTS OF CONCRETE FOR DETERMINING THEIR PHYSICAL PROPERTIES	BL3 APPLY
	EXPLAIN PROPERTIES OF FRESH AND HARDENED CONCRETE AND APPLY THIS KNOWLEDGE ON FIELD.	BL2 UNDERSTAND
	SELECT APPROPRIATE TYPE OF CONCRETE, ADMIXTURE AND CHEMICALS FOR SPECIFIC REQUIREMENTS	BL4 ANALYZE
	DESIGN A CONCRETE MIX OF REQUIRED STRENGTH AND DURABILITY, FOR GIVEN FIELD CONDITIONS, USING SUITABLE INGREDIENTS	BL3 APPLY
	EVALUATE PROPERTIES OF CONSTRUCTION MATERIALS VIZ. STEEL, BRICKS, TIMBER, TILES ETC. IN LABORATORY FOR THE QUALITY ASSURANCE	BL5 EVALUATE
COURSE: BUILDING CONSTRUCTION & DRAWING (CE34C)	ELUCIDATE FUNCTIONAL REQUIREMENTS OF BUILDINGS AND TYPES OF FOUNDATION AND ITS SUITABILITY.	BL2 UNDERSTAND
	IDENTIFY VARIOUS TYPES OF BONDS SUCH AS ENGLISH, FLEMISH, STRETCHER AND HEADER BOND.	BL2 UNDERSTAND
	DRAW NEAT DRAWINGS OF DIFFERENT BUILDING COMPONENTS SUCH AS DOORS, WINDOWS, STAIRSETC WITH THE SUITABLE SCALE USING CADD SOFTWARE	BL3 APPLY
	SELECTION OF PROPER TYPE OF FLOORING AND ROOFING AS PER THE CONDITIONS.	BL2 UNDERSTAND
	DRAW NEAT PERSPECTIVE VIEW DRAWINGS OF AN OBJECT AND GIVEN SMALL RESIDENTIAL BUILDING.	BL3 APPLY
	SELECT APPROPRIATE VENTILATION SYSTEMS AND BUILDING FINISHES.	BL2 UNDERSTAND
COURSE: STRUCTURAL MECHANICS-I (CE35C)	DISCUSS THE KNOWLEDGE OF STRUCTURAL MECHANICS TO DEPICT THE BEHAVIOR OF STRUCTURES.	BL2 UNDERSTAND
	CALCULATE PRINCIPAL PLANES AND FIND PRINCIPAL STRESSES.	BL3 APPLY
	APPLY THE KNOWLEDGE OF PRINCIPAL STRESSES FOR BENDING, TORSION, THRUST AND FAILURE ANALYSIS PROBLEMS	BL3 APPLY
	CONSTRUCT SHEAR FORCE DIAGRAMS AND BENDING MOMENT DIAGRAMS OF STATICALLY DETERMINATE BEAMS.	BL3 APPLY
	CALCULATE BENDING AND SHEAR STRESSES IN BEAMS.	BL3 APPLY
	ANALYZE THE BEHAVIOR OF STRUCTURE UNDER MOVING LOAD USING INFLUENCE LINE DIAGRAMS.	BL4 ANALYZE

COURSE: SURVEYING & GEOMATICS (CE36L)	UNDERSTAND THE TEMPORARY ADJUSTMENTS OF MODERN SURVEYING EQUIPMENTS AND THE ATTRIBUTES OF LEADERSHIP, WORKING IN THE TEAM AND PROFESSIONAL ETHICS WHILE PERFORMING THE SURVEYING PROJECTS.	BL2 UNDERSTAND
	ILLUSTRATE THE USE OF THE SURVEYING INSTRUMENTS NAMELY LEVELS EDM, TOTAL STATION FOR SURVEYING MEASUREMENTS SUCH AS HORIZONTAL/ VERTICAL/INCLINED DISTANCE, HORIZONTAL/ VERTICAL ANGLES, BEARINGS, REDUCED LEVELS, AND COORDINATES.	BL3 APPLY
	USE THE INFORMATION OF MODERN SURVEYING TECHNIQUES NAMELY GLOBAL POSITIONING SYSTEM FOR CIVIL ENGINEERING APPLICATIONS.	BL3 APPLY
	USE THE MODERN SURVEYING TECHNIQUES NAMELY REMOTE SENSING FOR CIVIL ENGINEERING APPLICATIONS	BL3 APPLY
	DETERMINE THE USE OF MODERN SURVEYING TECHNIQUES LIKE GEOGRAPHIC INFORMATION SYSTEM FOR CIVIL ENGINEERING APPLICATIONS SUCH AS DEVELOP PLANS, DRAW MAPS AND DRAFT REPORTS FOR SURVEYING PROJECTS OF CIVIL ENGINEERING WORKS.	BL3 APPLY
COURSE: FLUID MECHANICS AND FLUID MACHINES (CE37L)	COMPREHEND TECHNICAL PROPERTIES OF FLUIDS, CONCEPT OF SUBMERGED & FLOATING STRUCTURES IN A STATIC FLUID.	BL2 UNDERSTAND
	APPLY KINEMATICS AND DYNAMICS OF FLOW FOR SOLVING CIVIL ENGINEERING PROBLEMS.	BL3 APPLY
	QUANTIFY WATER FLOW THROUGH WEIRS, NOTCHES, VENTURIMETER, ORIFICE, AND PITOT TUBE.	BL3 APPLY
	DETERMINE PIPE LOSSES AND SOLVE PIPE NETWORKS.	BL3 APPLY
	EXPLAIN THE WORKING OF PELTON, FRANCIS AND KAPLAN TURBINES AND PUMPS ALONG THEIR PERFORMANCE PARAMETERS.	BL3 APPLY
COURSE: CONCRETE TECHNOLOGY, MATERIAL TESTING & EVALUATION (CE38L)	DEMONSTRATE LABORATORY TESTING OF VARIOUS INGREDIENTS OF CONCRETE FOR DETERMINING THEIR PHYSICAL PROPERTIES	BL3 APPLY
	DESIGN A CONCRETE MIX OF REQUIRED STRENGTH AND DURABILITY, FOR GIVEN FIELD CONDITIONS, USING SUITABLE INGREDIENTS	BL3 APPLY
	EVALUATE PROPERTIES OF CONSTRUCTION MATERIALS VIZ. STEEL, BRICKS, TIMBER, TILES ETC. IN LABORATORY FOR THE QUALITY ASSURANCE	BL5 EVALUATE
COURSE: BUILDING CONSTRUCTION &	ELUCIDATE FUNCTIONAL REQUIREMENTS OF BUILDINGS AND TYPES OF FOUNDATION AND ITS SUITABILITY.	BL2 UNDERSTAND
	IDENTIFY VARIOUS TYPES OF BONDS SUCH AS ENGLISH, FLEMISH, STRETCHER AND HEADER BOND.	BL2 UNDERSTAND

CONSTRUCTION & DRAWING (CE39L)	DRAW NEAT DRAWINGS OF DIFFERENT BUILDING COMPONENTS SUCH AS DOORS, WINDOWS, STAIRSETC WITH THE SUITABLE SCALE USING CADD SOFTWARE	BL3 APPLY
	DRAW NEAT PERSPECTIVE VIEW DRAWINGS OF AN OBJECT AND GIVEN SMALL RESIDENTIAL BUILDING.	BL3 APPLY
COURSE: LAB PRACTICE (CE410L)	DEMONSTRATE BASIC CONCEPTS OF THE AUTOCAD SOFTWARE.	BL1 REMEMBER
	APPLY BASIC CONCEPTS TO DEVELOP ARCHITECTURAL FLOOR PLAN OF SMALL RESIDENTIAL BUILDING.	BL3 APPLY
	UNDERSTAND GEOMETRIC CONSTRUCTION, MULTI-VIEW, DIMENSIONING AND DETAILED DRAWING OF TYPICAL 2-D ENGINEERED OBJECT.	BL2 UNDERSTAND
	PRODUCE VIEWS LIKE ELEVATION, SECTION , FURNITURE PLAN FOR SMALL RESIDENTIAL BUILDING.	BL4 ANALYZE
	UNDERSTAND AND DEMONSTRATE DIMENSIONING CONCEPTS AND TECHNIQUES FOR CIVIL ENGINEERING DRAWING.	BL2 UNDERSTAND
	PRODUCE TEMPLATE DRAWING.	BL4 ANALYZE

SEMESTER-II

Course Name & Code	**Course Outcomes**	**Bloom's Level**
COURSE: ENVIRONMENTAL ENGINEERING-I (CE41C)	EXAMINE VARIOUS DRINKING WATER QUALITY PARAMETERS AND FORECAST THE POPULATION OF THE CITY.	BL3 APPLY
	PLAN AND DESIGN WATER CONVEYANCE SYSTEMS FOR A RURAL/URBAN AREA BASED ON POPULATION FORECASTS.	BL3 APPLY
	DESIGN AERATION UNIT AND SETTLING UNIT ON THE BASIS OF RAW WATER QUALITY & WATER DEMAND.	BL3 APPLY
	DESIGN FILTRATION UNIT AND DISINFECTION UNIT ON THE BASIS OF RAW WATER QUALITY & WATER DEMAND.	BL3 APPLY
	APPLY KNOWLEDGE OF ADVANCED WATER TREATMENT PROCESSES FOR INDIVIDUAL WATER PURIFICATION UNITS.	BL3 APPLY
	PLAN AND DESIGN WATER DISTRIBUTION SYSTEMS.	BL3 APPLY

COURSE: BUILDING PLANNING & DESIGN (CE42C)	PREPARE PLAN OF RESIDENTIAL AND PUBLIC BUILDINGS, ACCORDING TO THE PREVALENT BUILDING BYELAWS	BL3 APPLY
	PREPARE â€˜MUNICIPAL BUILDING PERMISSION DRAWINGS' OF RESIDENTIAL BUILDINGS USING CADD SOFTWARE TOOLS	BL3 APPLY
	PREPARE PLAN OF APPROPRIATE BUILDING SERVICES AND RAINWATER HARVESTING SYSTEM FOR A BUILDING	BL3 APPLY
	EXPLAIN CONCEPT OF GREEN BUILDING AND LOW COST HOUSING	BL2 UNDERSTAND
	DESCRIBE APPROPRIATE ACOUSTICS, SOUND INSULATION AND FIRE FIGHTING ARRANGEMENTS FOR A BUILDING	BL2 UNDERSTAND
	DESCRIBE APPROPRIATE FIRE FIGHTING ARRANGEMENT FOR A BUILDING	BL2 UNDERSTAND
COURSE: STRUCTURAL MECHANICS-II (CE43C)	SOLVE THE PROBLEMS OF COLUMNS WITH DIFFERENT LOADING CONDITIONS	BL3 APPLY
	CALCULATE SLOPE AND DEFLECTION OF BEAMS UNDER DIFFERENT LOADING CONDITIONS	BL3 APPLY
	SOLVE THE PROBLEMS OF DETERMINATE ARCHES	BL3 APPLY
	CALCULATE THE DEGREE OF STATIC AND KINEMATIC INDETERMINANCY	BL3 APPLY
	ANALYSE INDETERMINATE BEAMS AND FRAMES USING FORCE METHOD	BL4 ANALYZE
	ANALYSE INDETERMINATE BEAMS AND FRAMES USING DISPLACEMENT METHOD	BL4 ANALYZE
COURSE: ENGINEERING MATHEMATICS-III (CE44B)	SOLVE HIGHER ORDER LINEAR DIFFERENTIAL EQUATIONS AND APPLICATIONS	BL3 APPLY
	SOLVE FIRST ORDER PARTIAL DIFFERENTIAL EQUATIONS	BL3 APPLY
	EXPRESS A FUNCTION IN TERMS OF SINE AND COSINE COMPONENTS SO AS TO MODEL SIMPLE PERIODIC FUNCTIONS	BL2 UNDERSTAND
	APPLY LAPLACE AND INVERSE LAPLACE TRANSFORMS FOR SOLVING LINEAR DIFFERENTIAL EQUATIONS	BL3 APPLY
	FIND THE RELATION BETWEEN TWO VARIABLES FOR THE GIVEN DATA USING REGRESSION	BL2 UNDERSTAND

	EXPLAIN VARIOUS PROBABILITY DISTRIBUTION FUNCTIONS	BL2 UNDERSTAND
COURSE: ENGINEERING GEOLOGY (CE45B)	DESCRIBE ISSUES CONCERNING THE GEOLOGICAL FORMATIONS AND GEOLOGICAL STRUCTURE OF A REGION.	BL2 UNDERSTAND
	IDENTIFY THE ROCKS AND MINERALS IN FIELD.	BL1 REMEMBER
	DESCRIBE THE CHARACTERISTICS OF THE MOST IMPORTANT GEOLOGICAL FORMATION AND PROBLEMS THAT MAY ARISE IN THE VARIOUS CIVIL ENGINEERING PROJECT IN SUCH FORMATION.	BL2 UNDERSTAND
	INTERPRET AND EXPLAIN THE GEOLOGICAL STRUCTURES IN THE GEOLOGICAL MAPS AND CROSS SECTION.	BL2 UNDERSTAND
	SOLVE TECHNICAL AS WELL AS GROUND WATER RELATED PROBLEMS.	BL3 APPLY
	INTERPRET GEOLOGICAL STUDY IN ORDER TO ASCERTAIN SECURE CONSTRUCTION AND OPERATION OF A CIVIL ENGINEERING PROJECTS LIKE DAM, RESERVOIRS HILLY ROADS AND RAILWAY TRACKS.	BL2 UNDERSTAND
COURSE: ENVIRONMENTAL ENGINEERING-I (CE46L)	EXAMINE VARIOUS DRINKING WATER QUALITY PARAMETERS AND FORECAST THE POPULATION OF THE CITY.	BL3 APPLY
	DESIGN AERATION UNIT AND SETTLING UNIT ON THE BASIS OF RAW WATER QUALITY AND WATER DEMAND.	BL3 APPLY
COURSE: BUILDING PLANNING & DESIGN (CE47L)	PREPARE PLAN OF RESIDENTIAL AND PUBLIC BUILDINGS, ACCORDING TO THE PREVALENT BUILDING BYELAWS	BL3 APPLY
	PREPARE â€˜MUNICIPAL BUILDING PERMISSION DRAWINGS' OF RESIDENTIAL BUILDINGS USING CADD SOFTWARE TOOLS	BL3 APPLY
	PREPARE PLAN OF APPROPRIATE BUILDING SERVICES AND RAINWATER HARVESTING SYSTEM FOR A BUILDING	BL3 APPLY
	EXPLAIN CONCEPT OF GREEN BUILDING AND LOW COST HOUSING	BL2 UNDERSTAND
	DESCRIBE APPROPRIATE ACOUSTICS, SOUND INSULATION AND FIRE FIGHTING ARRANGEMENTS FOR A BUILDING	BL2 UNDERSTAND
	DESCRIBE APPROPRIATE FIRE FIGHTING ARRANGEMENT FOR A BUILDING	BL2 UNDERSTAND

COURSE: BUILDING PLANNING & DESIGN (CE47L)	PREPARE PLAN OF RESIDENTIAL AND PUBLIC BUILDINGS, ACCORDING TO THE PREVALENT BUILDING BYELAWS	BL3 APPLY
	PREPARE â€˜MUNICIPAL BUILDING PERMISSION DRAWINGS' OF RESIDENTIAL BUILDINGS USING CADD SOFTWARE TOOLS	BL3 APPLY
	PREPARE PLAN OF APPROPRIATE BUILDING SERVICES AND RAINWATER HARVESTING SYSTEM FOR A BUILDING	BL3 APPLY
	EXPLAIN CONCEPT OF GREEN BUILDING AND LOW COST HOUSING	BL2 UNDERSTAND
	DESCRIBE APPROPRIATE ACOUSTICS, SOUND INSULATION AND FIRE FIGHTING ARRANGEMENTS FOR A BUILDING	BL2 UNDERSTAND
	DESCRIBE APPROPRIATE FIRE FIGHTING ARRANGEMENT FOR A BUILDING	BL2 UNDERSTAND
COURSE: COMPUTER PROGRAMMING & NUMERICAL METHODS (CE48L)	DEVELOP COMPUTER ALGORITHMS FOR SOLVING CIVIL ENGINEERING PROBLEMS.	BL3 APPLY
	UNDERSTAND MULTI-DIMENSIONAL ARRAYS BY USING PROGRAMMING LANGUAGE.	BL2 UNDERSTAND
	UNDERSTAND THE PRINCIPLES OF NUMERICAL METHODS USEFUL FOR CIVIL ENGINEERING PROBLEMS.	BL2 UNDERSTAND
	SOLVE THE NUMERICAL INTEGRATION USING COMPUTER PROGRAM IN C LANGUAGE.	BL3 APPLY
	SOLVE ORDINARY DIFFERENTIAL EQUATIONS USING COMPUTER PROGRAM IN C LANGUAGE.	BL3 APPLY
	ILLUSTRATE COMPUTER PROGRAM FOR CIVIL ENGINEERING BASED PROBLEMS USING STATISTICAL ANALYSIS.	BL2 UNDERSTAND
COURSE: ENGINEERING GEOLOGY (CE49L)	IDENTIFY THE ROCKS AND MINERALS IN FIELD.	BL1 REMEMBER
	INTERPRET AND EXPLAIN THE GEOLOGICAL STRUCTURES IN THE GEOLOGICAL MAPS AND CROSS SECTION.	BL2 UNDERSTAND
	INTERPRET GEOLOGICAL STUDY IN ORDER TO ASCERTAIN SECURE CONSTRUCTION AND OPERATION OF A CIVIL ENGINEERING PROJECTS LIKE DAM, RESERVOIRS HILLY ROADS AND RAILWAY TRACKS.	BL2 UNDERSTAND
	UNDERSTAND THE PRINCIPLES AND SKILLS FOR CRITICAL DESIGN THINKING.	BL2 UNDERSTAND

COURSE: DESIGN THINKING (HN411)	DETERMINE CUSTOMER NEEDS AND PRODUCT SPECIFICATIONS.	BL3 APPLY
	APPLY CREATIVITY AND PROTOTYPING IN PRODUCT DEVELOPMENT.	BL3 APPLY
	APPLY DESIGN THINKING FOR SERVICE SECTOR PROBLEM	BL3 APPLY
	EXPLAIN PRODUCT ARCHITECTURE AND FINANCE.	BL2 UNDERSTAND
	APPLY DESIGN FOR ENVIRONMENT PRINCIPLES TO A PRODUCT LIFE CYCLE.	BL3 APPLY

THIRD YEAR (2021-22)

SEMESTER-I

Course Name & Code	**Course Outcomes**	**Bloom's Level**
COURSE: DESIGN OF STEEL STRUCTURES (CV311-20)	APPLY â€˜LIMIT STATEâ€™ DESIGN APPROACH FOR DESIGNING VARIOUS ELEMENTS OF STEEL STRUCTURES FOR STRENGTH AND SERVICEABILITY.	BL3 APPLY
	DESIGN VARIOUS STEEL STRUCTURE ELEMENTS VIZ. BOLTED AND WELDED CONNECTIONS AS PER PROCEDURES DEFINED BY INDIAN STANDARD CODE OF PRACTICE : IS 800: 2007	BL3 APPLY
	DESIGN A TENSION MEMBERS ,COMPRESSION MEMBERS /COLUMN AS PER PROCEDURES DEFINED BY INDIAN STANDARD CODE OF PRACTICE : IS 800: 2007	BL3 APPLY
	ANALYZE BEAMS AND PORTAL FRAMES BY PLASTIC ANALYSIS APPROACH.	BL4 ANALYZE
	DESIGN A ROOF TRUSS AND ITS ELEMENTS AND CHOOSE APPROPRIATE IS CODE.	BL3 APPLY
	DESIGN A BEAM, COLUMN BASE AS PER PROCEDURES DEFINED BY INDIAN STANDARD CODE OF PRACTICE : IS 800: 2007	BL3 APPLY
COURSE: GEOTECHNICAL	DEMONSTRATE EXPERIMENTS ON SOIL TO CALCULATE VARIOUS INDICES AND STRENGTH PROPERTIES TO UNDERSTAND BEHAVIOR OF SOIL	BL3 APPLY
	APPLY BASIC HYDRAULIC FLOW PRINCIPLES TO SOILS, TO CALCULATE THE SEEPAGE THROUGH EARTH STRUCTURES AND FOUNDATIONS	BL3 APPLY
	APPLY ONE DIMENSIONAL CONSOLIDATION THEORY TO ESTIMATE TIME-DEPENDENT SETTLEMENTS OF FOUNDATIONS.	BL3 APPLY

GEOTECHNICAL ENGINEERING (CV312-20)	SELECT A SUITABLE METHOD FOR ESTIMATING EARTH PRESSURE FOR A GIVEN SITUATION.	BL4 ANALYZE
	DEMONSTRATE EXPERIMENTS ON SOIL TO CALCULATE PERMEABILITY & SHEAR STRENGTH TO UNDERSTAND BEHAVIOR OF SOIL	BL3 APPLY
	ANALYSIS OF STRESS ACTING ON SOIL	BL4 ANALYZE
COURSE: WASTE WATER ENGINEERING AND AIR POLLUTION (CV313-20)	EXPLAIN THE CHARACTERIZATION OF MUNICIPAL WASTE, AS WELL AS SEWAGE COLLECTION & CONVEYANCE SYSTEMS	BL2 UNDERSTAND
	EVALUATE AND DESIGN WASTE WATER COLLECTION SYSTEM AND WASTEWATER TREATMENT UNITS.	BL6 CREATE
	APPLY THE LOW COST TREATMENT TECHNOLOGIES TO TREAT THE SEWAGE	BL3 APPLY
	APPLY THE KNOWLEDGE FOR DISPOSAL OF TREATED/UNTREATED WASTE WATER	BL3 APPLY
	SELECT APPROPRIATE METHODS OF SOLID WASTE DISPOSAL AND MANAGEMENT OF HAZARDOUS WASTE	BL4 ANALYZE
	SUMMARIZE AIR POLLUTION IMPACTS AND PLAN FOR CONTROL IT	BL2 UNDERSTAND
COURSE: HIGHWAY AND TUNNEL ENGINEERING (CV314-20)	EXPLAIN VARIOUS MODES OF TRANSPORTATION & HIGHWAY DEVELOPMENT PLANS	BL2 UNDERSTAND
	DESIGN GEOMETRIC COMPONENTS OF HIGHWAY AND HIGHWAY PAVEMENTS AS PER IRC STANDARDS	BL4 ANALYZE
	USE TRAFFIC CHARACTERISTICS AND STUDIES FOR PAVEMENT DESIGN	BL3 APPLY
	EXPERIMENT VARIOUS HIGHWAY MATERIALS USING MODERN EQUIPMENTS AND INSTRUMENTS	BL4 ANALYZE
	ANALYZE ECONOMY OF HIGHWAY PROJECTS	BL4 ANALYZE
	EXPLAIN TUNNELING METHODS IN VARIOUS TYPES OF SOIL	BL2 UNDERSTAND
	ESTIMATE RUNOFF, BASED ON RAINFALL DATA AND WATERSHED CHARACTERISTICS.	BL3 APPLY

COURSE: HYDROLOGY AND WATER RESOURCES ENGINEERING (CV315-20)	CALCULATE A STREAM FLOW AND ESTIMATE DESIGN FLOOD FOR A CIVIL ENGINEERING PROJECT.	BL3 APPLY
	CALCULATE YIELD OF OPEN WELL AND TUBE WELL FOR VARIOUS TYPES OF AQUIFERS USING KNOWLEDGE OF GROUND WATER HYDROLOGY	BL3 APPLY
	ELABORATE NATIONAL AND STATE WATER POLICIES	BL2 UNDERSTAND
	SELECT APPROPRIATE WATER APPLICATION TECHNIQUE OF IRRIGATION, DEPENDING UPON TYPE OF CROP, SOIL MOISTURE AND WATER AVAILABILITY.	BL2 UNDERSTAND
	SELECT SUITABLE SOIL & WATER CONSERVATION TECHNIQUES FOR PARTICULAR WATERSHED.	BL3 APPLY
COURSE: LIFE SCIENCE (SELF LEARNING MODE) (CV316-20`)	EXPLAIN THE SOCIOLOGICAL,PERSPECTIVE, BROADLY DEFINED;USE SOCIOLOGICAL THEORY TO EXPLAIN SOCIAL PROBLEMS AND ISSUED :MAKE THEROTICAL INFORMED RECOMMENDATIONS TO ADDRESS CURRENT SOCIAL PROBLEM:AND DEMONSTRATE THE UTILITY OF THE SOCIOLOGICAL PERSPECT	BL2 UNDERSTAND
	DEMONSTRATE THE ABILITY TO INTERPRET,LOCATE,EVALUATE,GENERATE AND USE SOCIOLOGICALLY RELEVANT DATA TO TEST HYPOTHESIS AND DRAW EVIDENCE BASED CONCLUSIONS	BL3 APPLY
	INTEGRATE SOCIOLOGICAL THEORY,RESEARCH & DATA IN ORDER TO ASSESS VARIOUS EXPLANATION OF SOCIAL PHENOMENA & TO ASSESS SOCIAL POLICY	BL4 ANALYZE
COURSE: PLANNING AND DESIGN OF PUBLIC BUILDINGS (CV317-20)	UNDERSTAND THE PRINCIPLES AND NORMS OF PUBLIC BUILDING	BL1 REMEMBER
	BASIC FUNDAMENTALS OF CADD	BL2 UNDERSTAND
	PLAN AND DESIGN OF PUBLIC BUILDING WITH APPROPRIATE NORMS AND STANDARDS	BL6 CREATE
	PREPARE MUNICIPAL DRAWING FOR PUBLIC BUILDING	BL6 CREATE
	APPLY CADD SKILL FOR THE PUBLIC BUILDING DRAWING	BL3 APPLY
	KNOWLEDGE OF PUBLIC BUILDING THROUGH SITE VISIT	BL2 UNDERSTAND
	IDENTIFY AND FORMULATE CIVIL ENGINEERING PROBLEMS TO MEET DESIRED NEED WITHIN REALISTIC CONSTRAINTS	BL6 CREATE
	DESIGN THE SOLUTION USING MODERN DESIGN TOOLS AND TECHNIQUES WITH THE UNDERSTANDING OF THE IMPACT OF ENGINEERING SOLUTIONS IN A GLOBAL, ECONOMIC, ENVIRONMENTAL, AND SOCIETAL CONTEXT	BL6 CREATE

COURSE: MINI PROJECT USING APPLICATION SOFTWARE (CV318-20)	DEVELOP AN ABILITY TO WORK ON MULTIDISCIPLINARY ENVIRONMENT TO EVALUATE THE ECONOMIC AND FINANCIAL PERFORMANCE OF AN ENGINEERING ACTIVITY	BL5 EVALUATE
	BUILD MODELS, PROTOTYPES AND CONDUCT VARIOUS EXPERIMENTS TO DEVELOP DIVERSE SET OF DESIGN SOLUTIONS WITH APPROPRIATE CONSIDERATION FOR SAFETY	BL6 CREATE
	BREAK DOWN A COMPLEX PROBLEM INTO PARTS AND ANALYZE THE RELATIONSHIPS BETWEEN THE DIFFERENT PARTS OF COMPLEX PROBLEM	BL4 ANALYZE
	Ã‚Â SHOW AN ABILITY TO COMMUNICATE EFFECTIVELY IN TEAM AND PRESENT RESULTS AS A TEAM, WITH SMOOTH INTEGRATION, SUBSTANTIATED CONCLUSIONS AND DOCUMENTATION OF PROJECT WORK	BL3 APPLY

SEMESTER-II

Course Name & Code	Course Outcomes	Bloom's Level
COURSE: FOUNDATION ENGINEERING (CV321-20)	EVALUATE ULTIMATE BEARING CAPACITY AND SETTLEMENT OF VARIOUS TYPES OF SOILS	BL3 APPLY
	DEMONSTRATE VARIOUS FIELD TESTS SUCH AS PLATE LOAD TEST, SPT AND INTERPRET DATA OF FIELD TEST FOR EVALUATION OF BEARING CAPACITY	BL3 APPLY
	DESCRIBE GEOTECHNICAL DESIGN OF DIFFERENT TYPES OF FOUNDATIONS SUCH AS ISOLATED FOOTINGS, COMBINED FOOTING, RAFT FOUNDATION ETC	BL2 UNDERSTAND
	SELECT AND APPLY SUITABLE GROUND IMPROVEMENT TECHNIQUES FOR GIVEN FIELD AND LOADING CONDITIONS	BL4 ANALYZE
	DESIGN CANTILEVER AND ANCHORED SHEET PILE AND VARIOUS TYPES OF SOILS	BL3 APPLY
	APPLY THE KNOWLEDGE OF VARIOUS SLOPE STABILITY THEORIES OF DESIGN OF EMBANKMENTS	BL3 APPLY
COURSE: HYDRAULIC STRUCTURES & WATER POWER ENGG. (CV322-20)	PLAN AND DESIGN THE DAMS AND RESERVOIRS DEPENDING UPON THE WATER RESOURCES POTENTIAL	BL3 APPLY
	ANALYZE AND DESIGN GRAVITY DAMS AND EARTH DAMS (SIMPLE DESIGNS)	BL4 ANALYZE
	ELABORATE THE DESIGN PRINCIPLES OF ARCH DAMS AND WEIRS ON PERMEABLE FOUNDATIONS	BL4 ANALYZE
	CARRY OUT HYDRAULIC DESIGN OF SPILLWAYS AND CANAL STRUCTURES	BL6 CREATE
	SELECT APPROPRIATE METHOD OF RIVER TRAINING DEPENDING UPON RIVER CHARACTERISTICS	BL2 UNDERSTAND
	ESTIMATE WATER POWER POTENTIAL AT A SITE.	BL4 ANALYZE

COURSE: PROFESSIONAL ELECTIVE COURSE-I (CV323-20)	DEVELOP SOLID WASTE MANAGEMENT SYSTEMS WITH RESPECT TO ITS PHYSICAL PROPERTIES, AND ASSOCIATED CRITICAL CONSIDERATIONS IN VIEW OF EMERGING TECHNOLOGIES.	BL3 APPLY
	CSELECT AND ADOPT THE APPROPRIATE METHODS FOR SOLID WASTE COLLECTION, TRANSPORTATION, REDISTRIBUTION AND DISPOSAL AND SOLID WASTE HANDLING AND PROCESSING METHODS.	BL5 EVALUATE
	IDENTIFY THE TYPES OF COMPOSTING AND INCINERATORS.	BL2 UNDERSTAND
	EXPLAIN CHARACTERISTICS AND NATURE OF HAZARDS AND QUALITATIVE ESTIMATION OF DAMAGES, RISK ASSESSMENT AND MANAGEMENT.	BL2 UNDERSTAND
	IDENTIFY THE TYPES OF HAZARDS AND DESCRIBE METHODS OF DISPOSAL OF HAZARDOUS SOLID WASTE.	BL2 UNDERSTAND
	IMPLEMENT LEGAL, POLITICAL AND ADMINISTRATIVE CONSIDERATIONS IN DESIGN AND OPERATION OF SOLID AND HAZARDOUS WASTE MANAGEMENT.	BL3 APPLY
COURSE: DESIGN OF CONCRETE STRUCTURES-I (CV324-20)	APPLY â€˜LIMIT STATEâ€™ DESIGN APPROACH FOR DESIGNING VARIOUS ELEMENTS OF CONCRETE STRUCTURES FOR STRENGTH AND SERVICEABILITY	BL3 APPLY
	DESIGN VARIOUS TYPES OF SLABS VIZ. ONE WAY SLABS, ONE WAY CONTINUOUS SLABS, TWO WAY SLABS, CANTILEVER SLABS AS PER IS CODE	BL3 APPLY
	ANALYZE & DESIGN OF SINGLY & DOUBLY REINFORCED SECTIONS FOR FLEXURE, SHEAR & BOND AS PER IS CODES	BL3 APPLY, BL4 ANALYZE
	ANALYZE & DESIGN OF T-BEAMS, L-BEAMS & CONTINUOUS BEAMS AS PER IS CODE	BL3 APPLY, BL4 ANALYZE
	DESIGN OF BEAMS FOR COMBINED SHEAR, BENDING & TORSION AS PER IS CODE	BL3 APPLY
	ANALYZE & DESIGN OF RECTANGULAR & CIRCULAR COLUMNS WITH HELICAL REINFORCEMENT AS PER IS CODE	BL3 APPLY, BL4 ANALYZE
COURSE: PRINCIPLES OF MANAGEMENT AND QUANTITATIVE TECHNIQUES (CV325-20)	DEMONSTRATE LEADERSHIP QUALITY AS MEMBER OF A TEAM, FOR EFFECTIVE MANAGEMENT OF CONSTRUCTION PROJECTS.	BL3 APPLY
	APPLY THE VARIOUS OPTIMIZATION TECHNIQUES FOR DECISION MAKING IN CONSTRUCTION INDUSTRY.	BL3 APPLY
	DESCRIBE THE INVENTORY OF A PROJECT OR INDUSTRY.	BL2 UNDERSTAND
	ASSESS AND ASSURE ABOUT QUALITY OF MATERIALS AND WORKMANSHIP, IN CIVIL ENGINEERING PROJECTS.	BL5 EVALUATE

	DESCRIBE RESOURCES LIBRARY AND MARKET RATES, PERFORM RATE ANALYSIS .PREPARE A WBS (WORK BREAKDOWN STRUCTURE) AND PREPARE AN ESTIMATE ETC. USING THE ERP SYSTEM.	BL2 UNDERSTAND
	CALCULATE REVENUE TO DATE FOR THE PROJECT, EVALUATE THE PERFORMANCE OF A FIRM BASED ON FINANCIAL STATEMENTS AND MANAGE WORKING CAPITAL OF A CONSTRUCTION COMPANY.	BL3 APPLY
COURSE: SELF LEARNING MODULE-II (TECHNICAL) (CV326-20)	EXPLAIN THE RURAL ROADS AND DEVELOP RURAL ROAD NETWORK	BL2 UNDERSTAND
	DESIGN DIFFERENT ELEMENTS OF ROAD GEOMETRICS OF RURAL ROADS.	BL3 APPLY
	APPLY THE KNOWLEDGE OF USING LOCALLY AVAILABLE MATERIALS FOR CONSTRUCTION AND AIMAT LOW COST RURAL ROADS.	BL3 APPLY
	DESIGN THE RURAL ROAD PAVEMENT AS PER IRC STANDARDS.	BL3 APPLY
	EXPLAIN THE MECHANISM FOR CONSTRUCTION AND MAINTENANCE OF RURAL ROADS.	BL2 UNDERSTAND
	EXPLAIN THE SURFACE & SUBSURFACE DRAINAGE SYSTEM FOR RURAL ROADS.	BL2 UNDERSTAND
COURSE: PROJECT ON STEEL STRUCTURES (CV327-20)	DESIGN THE VARIOUS COMPONENTS OF INDUSTRIAL SHED WITH ROOF TRUSS OR PORTAL FRAME OR GABLE FRAME	BL5 EVALUATE
	PREPARE DRAWINGS OF INDUSTRIAL SHED WITH ROOF TRUSS INCLUDING GUSSET PLATES, BEARING PLATES AND FOUNDATION DETAILS	BL5 EVALUATE
	DESIGN THE VARIOUS COMPONENTS OF BUILDING FRAME/FOOT BRIDGE/WELDED PLATE GIRDER	BL5 EVALUATE
	PREPARE DRAWINGS OF BUILDING FRAME/FOOT BRIDGE/WELDED PLATE GIRDER IN DETAILS OF THE SECTIONS WITH BOLTED AND WELDED SYSTEM	BL5 EVALUATE
	ANALYZE ANY ONE OF THE STRUCTURE USING ANY STANDARD CIVIL ENGINEERING SOFTWARE	BL5 EVALUATE
	ANALYSIS AND DESIGN REPORT GENERATION AS PER THE REQUIREMENTS OF CIVIL ENGINEERING INDUSTRY.	BL5 EVALUATE
	DEMONSTRATE THE USE, INTERPRETATION AND APPLICATION OF AN APPROPRIATE INTERNATIONAL ENGINEERING STANDARD IN A SPECIFIC SITUATIONS	BL4 ANALYZE
	ANALYZE A GIVEN ENGINEERING PROBLEM, IDENTIFY AN APPROPRIATE PROBLEM SOLVING METHODOLOGY, IMPLEMENT THE METHODOLOGY AND PROPOSE A MEANINGFUL SOLUTION	BL4 ANALYZE

COURSE: ASSESSMENT OF FIELD TRAINING REPORT (CV328-20)	MANAGE A PROJECT WITHIN A GIVEN TIME FRAME	BL3 APPLY
	APPLY PRIOR ACQUIRED KNOWLEDGE IN PROBLEM SOLVING	BL3 APPLY
	ADOPT A FACTUAL APPROACH TO DECISION MAKING	BL4 ANALYZE
	EFFECTIVELY COMMUNICATE SOLUTION TO PROBLEMS	BL3 APPLY

FINAL YEAR (2021-22)

SEMESTER-I

Course Name & Code	Course Outcomes	Bloom's Level
COURSE: ENGINEERING ECONOMICS, ESTIMATION & COSTING (CV411)	SELECT SPECIFICATIONS FOR DIFFERENT ITEMS OF WORK IN A BUILDING.	BL4 ANALYZE
	EVALUATE QUANTITY OF VARIOUS CIVIL ENGINEERING WORKS AND RATE OF ITEMS OF WORK BASED ON MATERIAL AND WORKMANSHIP	BL5 EVALUATE
	CLASSIFY TYPES OF CONTRACTS AND TENDERS FOR CIVIL PROJECTS.	BL4 ANALYZE
	ILLUSTRATE PROFESSIONAL ETHICS IN CIVIL ENGINEERING SECTOR	BL4 ANALYZE
	INTERPRET CONCEPT OF VALUE, PRICE AND COST USED IN CIVIL ENGINEERING SECTOR.	BL2 UNDERSTAND
	EVALUATE VALUE OF LAND AND BUILDINGS USING DIFFERENT METHODS OF VALUATION	BL5 EVALUATE
COURSE: CONSTRUCTION ENGINEERING, MANAGEMENT & CONSTRUCTION PRACTICES (CV412)	PLAN THE PROJECT AND PREPARE BAR CHART AND NETWORK TO OPTIMIZE THE PROJECT DURATION AND COST	BL6 CREATE
	UPDATE THE NETWORK AND RE EVALUATE THE RESOURCES.	BL3 APPLY
	USE APPROPRIATE PROJECT MANAGEMENT APPLICATION SOFTWARE FOR PLANNING, TRACKING AND REPORTING PROGRESS OF CIVIL ENGINEERING PROJECTS.	BL3 APPLY
	CALCULATE OUTPUT OF EARTHMOVING, HOISTING, DREDGING EQUIPMENTS.	BL4 ANALYZE

	ADOPT APPROPRIATE SAFETY MEASURES FOR VARIOUS CIVIL ENGINEERING PROJECTS.	BL3 APPLY
	EXPLAIN PREFABRICATED CONSTRUCTIONS, DIAPHRAGM WALL CONSTRUCTIONS, ADVANCED FORMWORK AND HOT MIX PLANT.	BL2 UNDERSTAND
COURSE: DESIGN OF CONCRETE STRUCTURES-II (CV413-22)	DESIGN DOG LEGGED & OPEN WELL STAIRCASES	BL4 ANALYZE, BL5 EVALUATE
	DESIGN SQUARE, RECTANGULAR & ECCENTRIC FOOTINGS	BL4 ANALYZE, BL5 EVALUATE
	ANALYZE TENDON PROFILE & VARIOUS SYSTEMS OF PRESTRESSING	BL4 ANALYZE
	ANALYZE LOSSES IN PRE-TENSIONING & POST-TENSIONING PRESTRESS MEMBERS	BL4 ANALYZE
	DESIGN PRESTRESSED GIRDERS & END BLOCKS	BL4 ANALYZE, BL5 EVALUATE
	DESIGN RETAINING WALLS & RCC WATER TANKS AS PER IS CODE	BL4 ANALYZE, BL5 EVALUATE
COURSE: EARTHQUAKE ENGINEERING (CV414-22)	TO EXPLAIN CONCEPT OF SIESMOLOGY	BL2 UNDERSTAND
	TO DEMONSTRATE THE KNOWLEDGE OF DYNAMIC ANALYISIS	BL2 UNDERSTAND
	CORELATE THE KNOWLEDGE OF DYNAMICS FOR EARTHQUAKE ENGINERRING	BL2 UNDERSTAND, BL4 ANALYZE
	CALCULATE SIESMIC LOAD FOR MULTYSTORY BUILDING	BL4 ANALYZE, BL5 EVALUATE
	EVALUTION OF SIESMIC FORCES	BL4 ANALYZE, BL5 EVALUATE
	ADOPT CONCEPT OF EARTHQUAKE REISISTANCE LOW COST BUILDING CONCEPT FOR HIGH RISE BUILDING	BL4 ANALYZE, BL5 EVALUATE
	UNDERTAKE VARIOUS TRAFFIC STUDIES AND ANALYSIS OF TRAFFIC DATA INCLUDING PARKING STUDIES AND CALCULATION OF PARKING DEMAND.	BL4 ANALYZE
	EXPLAIN RELATION BETWEEN FLOW, DENSITY, SPEED, CONCEPT OF LEVEL OF SERVICE FOR URBAN AND RURAL AREA	BL2 UNDERSTAND

COURSE

COURSE: PROFESSIONAL ELECTIVE COURSE- II (CV415-22)	EXPLAIN THE REGULATIONS ON VEHICLE, DRIVER AND SPEED AND VEHICLE AS PER MOTOR VEHICLE RULES.	BL1 REMEMBER
	DESIGN INTERSECTIONS AND SIGNALS AND PROPOSE VARIOUS TRAFFIC SIGNS, ROAD MARKING AND LIGHTING AT VARIOUS LOCATIONS	BL3 APPLY
	DESIGN INTERSECTIONS AND SIGNALS AND PROPOSE VARIOUS TRAFFIC SIGNS, ROAD MARKING AND LIGHTING AT VARIOUS LOCATIONS	BL3 APPLY
COURSE: PROJECT ON R. C. C. STRUCTURES (CV416-22)	TO STUDY IS RECOMMENDATIONS & LIMIT STATE THEORY IN DESIGN OF STRUCTURES	BL1 REMEMBER
	ANALYSIS AND DESIGN OF RCC BUILDING	BL5 EVALUATE
	PREPARE DETAILED DRAWING OF RCC SECTIONS	BL2 UNDERSTAND
	ANALYSIS AND DESIGN OF COMBINED FOOTING	BL4 ANALYZE
	ANALYSIS AND DESIGN OF PILE FOUNDATION FOR STRUCTURE WITH PILE CAP	BL5 EVALUATE
	ANALYSIS AND DESIGN OF WATER TANK BY WORKING STRESS METHOD USING IS:3370	BL5 EVALUATE
COURSE: SEMINAR (CV417-22)	COLLECT INFORMATION, UNDERSTAND AND DESCRIBE IT	BL1 REMEMBER
	WRITE TECHNICAL DOCUMENTS AND GIVE ORAL PRESENTATIONS RELATED TO THE WORK COMPLETED	BL4 ANALYZE
	SHOW THE ABILITY TO COMMUNICATE EFFECTIVELY AS AN INDIVIDUAL	BL3 APPLY
	USE THE TECHNIQUES, SKILLS, AND MODERN TOOLS AND MODERN SOFTWARES	BL3 APPLY
	DEVELOP ABILITY TO UTILIZE VARIOUS TECHNICAL RESOURCES	BL4 ANALYZE
	UNDERSTAND PROFESSIONAL AND ETHICAL RESPONSIBILITY	BL4 ANALYZE
	IDENTIFY AND FORMULATE CIVIL ENGINEERING PROBLEMS TO MEET DESIRED NEED WITHIN REALISTIC CONSTRAINTS	BL5 EVALUATE, BL6 CREATE

COURSE: PROJECT WORK (CV418-22)	DESIGN THE SOLUTION USING MODERN DESIGN TOOLS AND TECHNIQUES WITH THE UNDERSTANDING OF THE IMPACT OF ENGINEERING SOLUTIONS IN A GLOBAL, ECONOMIC, ENVIRONMENTAL, AND SOCIETAL CONTEXT	BL5 EVALUATE, BL6 CREATE
	DEVELOP AN ABILITY TO WORK ON MULTIDISCIPLINARY ENVIRONMENT TO EVALUATE THE ECONOMIC AND FINANCIAL PERFORMANCE OF AN ENGINEERING ACTIVITY	BL4 ANALYZE, BL5 EVALUATE
	BUILD MODELS, PROTOTYPES AND CONDUCT VARIOUS EXPERIMENTS TO DEVELOP DIVERSE SET OF DESIGN SOLUTIONS WITH APPROPRIATE CONSIDERATION FOR SAFETY	BL5 EVALUATE, BL6 CREATE
	BREAK DOWN A COMPLEX PROBLEM INTO PARTS AND ANALYZE THE RELATIONSHIPS BETWEEN THE DIFFERENT PARTS OF COMPLEX PROBLEM	BL4 ANALYZE
	SHOW AN ABILITY TO COMMUNICATE EFFECTIVELY IN TEAM AND PRESENT RESULTS AS A TEAM, WITH SMOOTH INTEGRATION, SUBSTANTIATED CONCLUSIONS AND DOCUMENTATION OF PROJECT WORK	BL3 APPLY
COURSE: ASSESSMENT OF REPORT ON FIELD TRAINING-II (CV419-22)	DEMONSTRATE THE USE,INTERPRETATION AND APPLICATION OF AN APPROPRITE INTERNATIONAL ENGINEERING STANDARD IN A SPECIFIC SITUTATIONS.	BL3 APPLY
	ANALYZE A GIVEN ENGINEERING PROBLEM, IDENTIFY AN APPROPRIATE PROBLEM SOLVING METHODOLOGY ,IMPLEMENT THE METHODOLOGY AND PROPOSE A MEANINGFUL SOLUTION.	BL5 EVALUATE
	CONCLUDE A PROJECT WITHIN A GIVEN TIME FRAME.	BL5 EVALUATE
	APPLY PRIOR ACQUIRED KNOWLEDGE IN PROBLEM SOLVING	BL3 APPLY
	APPLY FACTUAL APPROACH TO DECISION MAKING.	BL2 UNDERSTAND
	RECOMMING SOLUTION TO RESOLVE PROBLEMS.	BL5 EVALUATE

SEMESTER-II

Course Name & Code	**Course Outcomes**	**Bloom's Level**
COURSE: PROFESSIONAL ELECTIVE-III (CV421-21)	UNDERSTAND VARIOUS AIR POLLUTANTS, THEIR SOURCE OF GENERATION, THEIR IMPACTS, THEIR EFFECTS ON HUMAN, PLANTS, ENVIRONMENT & MATERIALS	BL2 UNDERSTAND
	APPLY KNOWLEDGE OF METEOROLOGY FOR CONTROLLING AIR POLLUTANT	BL3 APPLY
	DESIGN AIR POLLUTION CONTROLLING EQUIPMENT	BL3 APPLY
	APPLY KNOWLEDGE OF LEGISLATION FOR PREVENTION AND CONTROL OF AIR POLLUTION	BL3 APPLY

	ANALYZE QUALITY OF AIR IN THE FORM OF AIR QUALITY INDEX & DISPERSION MODELING	BL4 ANALYZE
	UNDERSTANDING THE CONCEPT OF NOISE & ITS CONTROL.	BL2 UNDERSTAND
COURSE: PROFESSIONAL ELECTIVE-IV (CV422-21)	DESCRIBE THE KNOWLEDGE OF CEMENT, CONCRETE AND ADMIXTURE TO FULFIL REQUIREMENT OF CONSTRUCTION INDUSTRY.	BL2 UNDERSTAND
	DEMONSTRATE PROPERTIES OF FRESH CONCRETE AND DURABILITY OF CONCRETE	BL3 APPLY
	DESCRIBE PROPERTIES AND APPLICATION OF SPECIAL CONCRETE	BL2 UNDERSTAND
	EXPLAIN SPECIAL PROCESS AND TECHNOLOGY FOR PARTICULAR TYPE OF CONCRETE STRUCTURES	BL2 UNDERSTAND
	DESIGN A CONCRETE MIX ACCORDING TO CONSTRUCTION INDUSTRY STIPULATION	BL5 EVALUATE
	DESCRIBE STRENGTHENING TECHNIQUES OF CONCRETE STRUCTURES DUE TO DISTRESS IN CONCRETE	BL2 UNDERSTAND
COURSE: RAILWAY AND HARBOUR ENGINEERING (CV423-21)	SHOW GEOMETRIC DESIGN FOR THE RAILWAY TRACKS.	BL3 APPLY
	UNDERSTAND THE CONSTRUCTION TECHNIQUES AND MAINTENANCE OF TRACK LAYING AND RAILWAY STATIONS AND CALCULATE THE MATERIAL QUANTITIES REQUIRED FOR CONSTRUCTION.	BL2 UNDERSTAND
	.EXPLAIN DIFFERENT TYPES OF SIGNALS EXPLAIN THE WORKING PRINCIPLES OF RAILWAY INTERLOCKING SYSTEM.	BL2 UNDERSTAND
	SHOW AIRPORT LAYOUT, DESIGN FACILITIES REQUIRED FOR RUNWAY, TAXIWAY AND IMPART	BL3 APPLY
	ANALYZE AND DESIGN THE ELEMENTS FOR ORIENTATION OF RUNWAYS AND PASSENGER FACILITY SYSTEMS.	BL4 ANALYZE
	UNDERSTAND THE VARIOUS FEATURES IN HARBOURS AND PORTS, THEIR CONSTRUCTION, COASTAL PROTECTION WORKS AND COASTAL REGULATIONS TO BE ADOPTED.	BL2 UNDERSTAND
	ANALYZE INDIA'S ECONOMIC GROWTH AND DEVELOPMENT	BL4 ANALYZE
	ASSESS INDUSTRIAL REFORMS IN A MIXED ECONOMIC SET-UP	BL3 APPLY, BL4 ANALYZE

COURSE: OPEN ELECTIVE III-ECONOMIC POLICIES IN INDIA (CV424-21)	SUGGEST TAX REFORMS AND FINANCIAL SECTOR REFORMS	BL4 ANALYZE
	EXPLAIN INDIAN BANKING SECTOR DEVELOPMENTS	BL3 APPLY
	ANALYZE INDIA AND WTO REGULATIONS	BL4 ANALYZE
	ANALYZE RECENT POLICY INITIATIVES	BL4 ANALYZE
COURSE: PROFESSIONAL PRACTICE,LAW AND ETHICS (CV425-21)	EXPLAIN ROLE OF VARIOUS STAKEHOLDERS IN THE CIVIL ENGINEERING PROFESSION	BL2 UNDERSTAND
	INTERPRET AND EXPLAIN FUNDAMENTAL ETHICS GOVERNING THE PROFESSION SOCIETY AS PRACTITIONERS OF THE CIVIL ENGINEERING PROFESSION.	BL2 UNDERSTAND
	DRAFT AND INTERPRET CONTRACTS AND CONTRACTS MANAGEMENT IN CIVIL ENGINEERING, DISPUTE RESOLUTION MECHANISMS AND LAWS GOVERNING ENGAGEMENT OF LABOUR	BL2 UNDERSTAND
	DESCRIBE ARBITRATION AND EXPERT DETERMINATION; EXTENT OF JUDICIAL INTERVENTION; INTERNATIONAL COMMERCIAL ARBITRATION;	BL2 UNDERSTAND
	EXLAIN LEGAL AND PRACTICAL ASPECTS OF CIVIL ENGINEERING PROFESSION	BL2 UNDERSTAND
	EXPLAIN PROCESS OF FILING INTELLECTUAL PROPERTY RIGHTS AND PATENTS.	BL2 UNDERSTAND
COURSE: PROJECT WORK (CV426-21)	IDENTIFY AND FORMULATE CIVIL ENGINEERING PROBLEMS TO MEET DESIRED NEED WITHIN REALISTIC CONSTRAINTS	BL6 CREATE
	DESIGN THE SOLUTION USING MODERN DESIGN TOOLS AND TECHNIQUES WITH THE UNDERSTANDING OF THE IMPACT OF ENGINEERING SOLUTIONS IN A GLOBAL, ECONOMIC, ENVIRONMENTAL, AND SOCIETAL CONTEXT	BL6 CREATE
	DEVELOP AN ABILITY TO WORK ON MULTIDISCIPLINARY ENVIRONMENT TO EVALUATE THE ECONOMIC AND FINANCIAL PERFORMANCE OF AN ENGINEERING ACTIVITY	BL5 EVALUATE
	BUILD MODELS, PROTOTYPES AND CONDUCT VARIOUS EXPERIMENTS TO DEVELOP DIVERSE SET OF DESIGN SOLUTIONS WITH APPROPRIATE CONSIDERATION FOR SAFETY	BL6 CREATE
	BREAK DOWN A COMPLEX PROBLEM INTO PARTS AND ANALYZE THE RELATIONSHIPS BETWEEN THE DIFFERENT PARTS OF COMPLEX PROBLEM	BL4 ANALYZE
	SHOW AN ABILITY TO COMMUNICATE EFFECTIVELY IN TEAM AND PRESENT RESULTS AS A TEAM, WITH SMOOTH INTEGRATION, SUBSTANTIATED CONCLUSIONS AND DOCUMENTATION OF PROJECT WORK	BL3 APPLY

2.6.1

Programme and Course of the Programmes Offered by the Institution

DEPARTMENT OF COMPUTER SCIENCE& ENGINEERING						
SECOND YEAR (2021-22)						
SEMESTER-I				SEMESTER-II		
Course Name & Code	Course Outcomes	Bloom's Level		Course Name & Code	Course Outcomes	Bloom's Level
APPLIED MATHEMATICS-I (CS211-21)	STUDENT CAN SOLVE HIGHER ORDER LINEAR DIFFERENTIAL EQUATION WITH CONSTANT COEFFICIENT	BL3		APPLIED MATHEMATICS-I I (CS221-21)	STUDENT CAN SOLVE ALGEBRAIC AND TRANSCENDENTAL EQUATIONS	BL3
	STUDENT CAN APPLY LAPLACE AND INVERSE LAPLACE TRANSFORMS FOR SOLVING LINEAR DIFFERENTIAL EQUATIONS.	BL3			STUDENT CAN SOLVE SIMULTANEOUS LINEAR AND NONLINEAR EQUATIONS	BL3
	STUDENT CAN EXPRESS A FUNCTION IN TERMS OF SINEâ€™S AND COSINES COMPONENTS SO AS TO MODEL SIMPLE PERIODIC FUNCTIONS	BL3			STUDENTS CAN APPLY NUMERICAL METHODS TO EVALUATE DEFINITE INTEGRAL	BL3
	STUDENT CAN SOLVE PROBLEMS ON Z TRANSFORM AND EXPLAIN ITS PROPERTIES	BL3			STUDENTS CAN APPLY KNOWLEDGE OF BASICS OF FUZZY SET THEORY TO SOLVE THE PROBLEMS	BL3
	STUDENT CAN FIND THE RELATION BETWEEN TWO VARIABLES FOR THE GIVEN DATA USING REGRESSION AND EXPLAIN VARIOUS PROBABILITY DISTRIBUTION FUNCTIONS	BL4			STUDENTS CAN SOLVE THE FUZZY EQUATIONS	BL3
	STUDENT CAN SOLVE PROBLEMS BASED ON QUEUING THEORY.	BL3			STUDENTS CAN SOLVE A PARTICULAR KIND OF PROBLEMS ARISES IN DAY TO DAY LIFE USING SIMPLEX METHOD AND ASSIGNMENT PROBLEMS	BL3
Discrete Mathematical structure (CS212)	TO GET ACQUAINTED TO BASIC CONNECTIVES AND FIND EQUIVALENT FORMULAS AND NORMAL FORMS.	BL2		Theory of Computation (CS222)	Construct finite automaton for a given regular expression and Simplify automata	BL3 APPLY
	TO DRAW IMPLICATIONS FROM BASIC PRIMITIVES	BL3			Apply the Kleene's Theorem to solve NFA problems	BL3 APPLY
	TO INTRODUCE SET THEORY AND RELATIONS WITH ILLUSTRATIONS	BL3			Explain Context Free Grammar and parsing techniques.	BL2 UNDERSTAND
	TO INTRODUCE THE CONCEPTS OF FUNCTIONS AND ITS TYPES THROUGH SCENARIOS.	BL3			Construct a pushdown automaton for a given CFL and CFG.	BL3 APPLY
	TO DEFINE TYPES OF ALGEBRAIC SYSTEMS AND APPLICATIONS	BL3			Explain Pumping Lemma property and closure properties of context-free languages.	BL2 UNDERSTAND
					Construct a Turing machine for given problem and variations of Turing machines	BL3 APPLY

Data Communication(CS 213)	Send data through various data communication modes.	BL1		**Computer Organization and Architecture CS223**	DESCRIBE THE FUNCTIONAL ARCHITECTURE OF COMPUTING SYSTEMS	BL2 Understand
	Differentiate between the OSI reference model and TCP/IP model.	BL2			TO HELP STUDENT TO UNDERSTAND VARIOUS MEMORY MODULE	BL2 Understand
	Identify and classify different physical media and devices.	BL2			ANALYZE VARIOUS PARALLEL PROGRAMMING MODEL	BL3 APPLY
	Demonstrate functions of Data Link Layer.	BL3			TO FACILITATE STUDENT IN UNDERSTANDING IN LEARNING IO COMMUNICATION.	BL2 Understand
	Implement IEEE standard frame format and understdifferent medium access protocols.	BL3			USE ARC PROCESSOR BASED INSTRUCTIONS TO WRITE ASSEMBLY LANGUAGE PROGRAM	BL3 APPLY
	Simulate different routing algorithms in Network Layer.	BL4			UNDERSTAND THE DESIGN ASPECTS OF MEMORY, INSTRUCTION LEVEL PARALLELISM AND MULTIPROCESSORS.	BL2 Understand
Data Structures (CS224)	Define the basic concepts of data structures and demonstrate stack as a linear data structure	BL2 Understand		**Computer Networks cs224**	Demonstrate the purpose of IP	BL2
	Develop programming skills to implement and analyze Queues as a linear data structures.	BL3 Apply			Analyse application protocol using the services offered by the transport layer protocol such as, TCP,UDP etc.	BL1
	Develop programming skills to implement Linked list as a linear data structures and apply this data structure for problem solving.	BL3 Apply			Develop client server model , chat application program using socket programming	BL3
	Develop programming skills to implement and analyze Binary Tree, Binary Search Tree as a nonlinear data structure.	BL3 Apply			Show the function the functioning of DHCP ,DNS BOOTP.	BL2
	Apply various operations on multi-way search trees, B-trees, AVL tree and evaluate their performance.	BL3 Apply			Explain the various features and oeration of application layer protocol	BL2
	Develop skills to design and implement graph data structure and build real life applications using it	BL3 Apply			Explain the functioning of web based mail system and web services mechanism	BL2
Computer Graphics (CS215)	DRAW GRAPHICAL ELEMENTS USING BUILT-IN GRAPHIC FUNCTIONS	BL1		**OOP Using Java cs225**	UNDERSTAND JAVA RUNTIME ENVIRONMENT AND FUNDAMENTALS OF JAVA	BL2
	DIFFERENTIATE DIFFERENT GRAPHICAL DEVICES.	BL4			CONSTRUCT OBJECT-ORIENTED PROGRAMS USING JAVA LANGUAGE	BL3
	DRAW LINES, CIRCLES AND FILL POLYGONS.	BL3			APPLY THE ADVANCED CONCEPTS OF JAVA VIZ. INHERITANCE, EXCEPTION HANDLING, MULTITHREADING, PACKAGE AND INTERFACE	BL3
	APPLY SIMPLE 2D AND 3D TRANSFORMATIONS TO GIVEN OBJECT AND CREATE SIMPLE 2D ANIMATIONS	BL3			APPLY CLIENT-SERVER METHODOLOGY USING SOCKET PROGRAMMING	BL3
	DEMONSTRATE DIFFERENT CLIPPING ALGORITHMS, SURFACES AND DIFFERENT TYPES OF CURVES	BL2			DEMONSTRATE GUI PROGRAMMING USING SWING	BL3

Microprocessors CS215	STUDENTS DEMONSTRATE THE BASIC MICR0PROCESSOR ARCHITECTURE AND ITS FUNCTIONALITY	BL2 Understand		**Machine Learning CSHN411-21**	UNDERSTAND MACHINE LEARNING CONCEPTS.	BL2
	TO IMPLEMENT SIMPLE ASSEMBLY LANGUAGE PROGRAMS	BL1 REMEMBER			DEMONSTRATE TYPE OF MACHINE LEARNING	BL2
	TO IMPLEMENT SIMPLE ASSEMBLY LANGUAGE PROGRAMS FOR INTERFACING	BL3 APPLY			DESIGN A MODEL BY SELECTING APPROPRIATE MACHINE LEARNING FOR A GIVEN PROBLEM	BL3
	DIFFERENTIATE BETWEEN 8086, 80286, 80386 AND 8086	BL2 Understand			ESTIMATING DESIGNED MACHINE LEARNING MODEL.	BL2
	TO BUILD THE INTERFACING BETWEEN MICROPROCESSOR AND VARIOUS PERIPHERALS	BL3 APPLY			APPLY AND TUNE MACHINE LEARNING MODEL BASED ON VARIOUS PARAMETERS.	BL3
					DISCUSS VARIOUS APPLICATIONS USING MACHINE LEARNING	BL2
Python Programming CS216	UNDERSTAND INSTALLATION OF PYTHON INTERPRETER	BL1 REMEMBER, BL2 UNDERSTAND				
	UNDERSTAND THE PYTHON FUNDAMENTALS	BL2 UNDERSTAND, BL3 APPLY				
	APPLY FUNDAMENTAL LIBRARY PACKAGES AVAILABLE IN PYTHON	BL2 UNDERSTAND, BL3 APPLY				
	DESIGN AND IMPLEMENT PYTHON APPLICATION USING GUI	BL3 APPLY				
	APPLY PYTHON PROGRAMMING LANGUAGE FOR TESTING AND DEBUGGING THE PROGRAM	BL2 UNDERSTAND, BL3 APPLY				
	DEVELOP PROFICIENCY IN CREATING APPLICATION USING PYTHON PROGRAMMING LANGUAGE	BL3 APPLY, BL4 ANALYZE				
THIRD YEAR (2021-22)						
SEMESTER-I				**SEMESTER-II**		
SYSTEM PROGRAMMING (CS311-20)	IDENTIFY THE REQUIREMENT OF DIFFERENT SYSTEM SOFTWARE FOR THE EXECUTION OF APPLICATION SOFTWARE.	BL2 UNDERSTAND		**Compiler Construction (CS321)**	DESCRIBE LANGUAGE TRANSLATION AND COMPILER DESIGN CONSTRUCTS.	BL1 REMEMBER
	DESIGN AND IMPLEMENT VARIOUS SYSTEM PROGRAMS ASSEMBLER AND MACROS.	BL6 CREATE			DESIGN AND DEVELOP LEXICAL ANALYZER AND PARSER.	BL4 ANALYZE
	RECOGNIZE THE IMPORTANCE OF LANGUAGE PROCESSING DEVELOPMENT TOOLS IN FORMAL LANGUAGE IMPLEMENTATION.	BL2 UNDERSTAND			DESCRIBE STORAGE ALLOCATION STRATEGIES FOR MEMORY ALLOCATION	BL2 UNDERSTAND
	DEMONSTRATE THE WORKING PRINCIPLES OF SYSTEM SOFTWARE	BL2 UNDERSTAND, BL4 ANALYZE			DESCRIBE VARIOUS ISSUES IN CODE GENERATION	BL2 UNDERSTAND
	EXAMINE THE FUNCTION OF LINKER AND LOADER	BL4 ANALYZE			APPLY OPTIMIZATION PRINCIPLES FOR GENERATING CODE	BL3 APPLY
	EXPLAIN THE ROLE OF OPERATING SYSTEM AND WORKING OF DIFFERENT OPERATING SYSTEMS.	BL2 UNDERSTAND			EXPLAIN THE STRUCTURE OF UNIX .	BL2 UNDERSTAND

OPERATING SYSTEMS (CS312-20)	UNDERSTANDING THE CONCEPTS OF PROCESS AND THREADS ALONG WITH ITS WORKING.	BL2 UNDERSTAND
	COMPARE DIFFERENT CPU SCHEDULING ALGORITHMS	BL4 ANALYZE
	INTERPRETING TYPICAL SEMAPHORE PROBLEM AND OTHER PROBLEMS OF SYNCHRONIZATION ALONG WITH MONITORS.	BL2 UNDERSTAND
	LEARN THE PRINCIPLES OF DEADLOCK AND METHODS FOR HANDLING DEADLOCKS ALONG WITH DIFFERENT MEMORY MANAGEMENT TECHNIQUES.	BL2 UNDERSTAND
	DEMONSTRATE VIRTUAL MEMORY MANAGEMENT AND DIFFERENT PAGE REPLACEMENT TECHNIQUES IN USE	BL2 UNDERSTAND
Software Engineering (CS313)	DEVELOP THE SOFTWARE PROJECT USING APPROPRIATE PROCESS	BL1 REMEMBER
	DEVELOP A SOFTWARE PROJECT FROM REQUIREMENT GATHERING TO IMPLEMENTATION.	BL2 UNDERSTAND
	CREATE DESIGN OF SYSTEM BY USING DIFFERENT DESIGN TECHNIQUES	BL2 UNDERSTAND
	ESTIMATE THE COST AND EFFORT OF SOFTWARE PROJECT.	BL5 EVALUATE
	IMPROVE QUALITY OF THE SOFTWARE PROJECT BY APPLYING TESTING OF SOFTWARE	BL3 APPLY
	INFLUENCE ACTIVITIES IN SOFTWARE PROJECT BY USING PROJECT PLANNING, EXECUTION & CLOSURE WITH NEW AGILE METHOD	BL3 APPLY
Database Engineering (CS314)	DEFINE & APPLY THE BASIC CONCEPT OF DATABASE SYSTEM, DESIGN, RELATIONAL MODEL AND SCHEMAS.	BL3 APPLY
	DESIGN PRINCIPLES FOR LOGICAL DESIGN OF DATABASES INCLUDING THE E-R METHOD AND NORMALIZATION APPROACH FOR ANY REAL TIME APPLICATION	BL3 APPLY
	EVALUATE USING RELATIONAL ALGEBRA AND SQL SOLUTIONS TO A BROAD RANGE OF QUERY PROBLEMS IN A RELATIONAL DBMS	BL6 CREATE
	DEMONSTRATE AN UNDERSTANDING OF NORMALIZATION THEORY AND APPLY SUCH KNOWLEDGE TO NORMALIZE A DATABASE	BL5 EVALUATE
	COMPARE THE BASIC DATABASE STORAGE STRUCTURE & ACCESS TECHNIQUES: INDEXING METHODS INCLUDING B-TREE AND HASHING	BL6 CREATE

Unix Operating System (CS 322)	IMPLEMENT SCENARIOS FOR RETRIEVAL OF BUFFER	BL3 APPLY
	IMPLEMENT ALGORITHMS FOR INODE ASSIGNMENT AND DISK BLOCK ALLOCATION(REGULAR FILE)	BL3 APPLY
	WRITE SYNTAX FOR DIFFERENT SYSTEM CALLS AND USE THESE SYSTEM CALLS IN PROGRAM.	BL3 APPLY
	EXPLAIN THE CONCEPTS OF MEMORY AND I/O MANAGEMENT.	BL2 UNDERSTAND
	WRITE AND EXECUTE PROGRAMS USING SHELL PROGRAMMING	BL3 APPLY
Computer Organization and Architecture (CS323)	DESCRIBE THE FUNCTIONAL ARCHITECTURE OF COMPUTING SYSTEMS.	BL2 UNDERSTAND, BL3 APPLY
	ANALYZE VARIOUS ALGORITHMS FOR ARITHMETIC COMPUTATION AND ARRIVE AT FASTEST ONE.	BL2 UNDERSTAND, BL4 ANALYZE
	USE ARC PROCESSOR BASED INSTRUCTIONS TO WRITE ASSEMBLY LANGUAGE PROGRAM.	BL2 UNDERSTAND, BL6 CREATE
	DEMONSTRATE THE DESIGN ASPECTS OF MEMORY, INSTRUCTION LEVEL PARALLELISM AND MULTIPROCESSORS.	BL1 REMEMBER, BL4 ANALYZE, BL5 EVALUATE
	TO DESIGN THE COMPUTER ARCHITECTURE	BL4 ANALYZE, BL6 CREATE
Artificial Intelligence (CS324)	FORMULATE AND SOLVE SEQUENCE OF ACTIONS FOR AN AGENT AS A SEARCH PROBLEM.	BL3 APPLY
	INFER FROM REPRESENTED KNOWLEDGE USING LOGICAL AND PROBABILISTIC REASONING METHODS	BL3 APPLY
	SOLVE AGENT DECISION PROBLEMS USING PROBABILITY THEORY	BL3 APPLY
	COMPREHEND FORMS OF LEARNING AND DEMONSTRATE THEIR WORKING.	BL3 APPLY

	FAMILIAR WITH THE BASIC ISSUES OF TRANSACTION PROCESSING (ACID PROPERTIES) DIFFERENT METHODS OF CONCURRENCY CONTROL AND RECOVERY TECHNIQUES.	BL5 EVALUATE				
DESIGN AND ANALYSIS OF ALGORITHM (CS315)	APPLY ASYMPTOTIC RULES TO SIMPLE PROGRAM/ALGORITHM	BL2 UNDERSTAND, BL3 APPLY		**Artificial Intelligence CS324-20**	FORMULATE AND SOLVE SEQUENCE OF ACTIONS FOR AN AGENT AS A SEARCH PROBLEM.	BL3 APPLY
	CALCULATE THE TIME AND SPACE COMPLEXITY OF AN ALGORITHM	BL2 UNDERSTAND, BL3 APPLY			INFER FROM REPRESENTED KNOWLEDGE USING LOGICAL AND PROBABILISTIC REASONING METHODS	BL3 APPLY
	DEMONSTRATE THE FAMILIARITY WITH THE MAJOR ALGORITHM(SEARCHING AND SORTING)	BL3 APPLY, BL4 ANALYZE			SOLVE AGENT DECISION PROBLEMS USING PROBABILITY THEORY	BL3 APPLY
	APPLY IMPORTANT ALGORITHMIC DESIGN PARADIGMS AND METHODS OF ANALYSIS	BL4 ANALYZE			COMPREHEND FORMS OF LEARNING AND DEMONSTRATE THEIR WORKING	BL3 APPLY
	APPLY ALGORITHM DESIGN PARADIGM TO SOLVE REAL LIFE PROBLEM	BL4 ANALYZE				
	DESCRIBE AND DISTINGUISH COMPLEXITY CLASSES OF PROBLEMS	BL4 ANALYZE				
PYTHON PROGRAMMING (CS316-20)	UTILIZE PYTHON STANDARD LIBRARY MODULES IN WRITING PYTHON SCRIPTS FOR PROBLEM SOLVING.	BL3 APPLY		**Mobile Application Development (CS325)**	UNDERSTAND MOBILE APP DEVELOPMENT ASPECTS, SERVICES.	BL2 UNDERSTAND
	DEMONSTRATE PYTHON SCRIPTS IN PROCEDURAL AND OBJECT-ORIENTED STYLE.	BL2 UNDERSTAND			DEMONSTRATE NEW APPLICATIONS TO HANDLE DEVICES WITH CAPABILITIES AS COMMUNICATION, COMPUTING ETC.	BL3 APPLY
	DEVELOP PYTHON SCRIPTS TO PERFORM DATABASE OPERATION	BL3 APPLY			ANALYSE TESTING, SIGNING, PACKAGING AND DISTRIBUTION OF MOBILE APPS	BL4 ANALYZE
	DEVELOP PYTHON SCRIPTS TO PERFORM NETWORK AND WEB RELATED OPERATIONS.	BL3 APPLY			DEVELOP SIMPLE PROGRAMS ON C# LANGUAGE	BL6 CREATE
	TEST AND PROFILE PYTHON SCRIPTS	BL6 CREATE			DEVELOP MOBILE APPLICATIONS USING CROSS PLATFORM MOBILE APPLICATION DEVELOPMENT USING XAMARIN	BL6 CREATE
	DEVELOPING CUSTOM EXCEPTION	BL3 APPLY				
Java Programming (CS317)	UNDERSTAND JAVA RUNTIME ENVIRONMENT AND FUNDAMENTALS OF JAVA.	BL2 UNDERSTAND		**Elective-I Data Science (CS326C-20)**	UNDERSTAND THE CONCEPT OF DATA SCIENCE	BL2 UNDERSTAND
	DEVELOP OBJECT ORIENTED PROGRAMMING PARADIGMS USING JAVA LANGUAGE.	BL3 APPLY			DEMONSTRATE UNDERSTANDING OF THE MATHEMATICAL FOUNDATIONS NEEDED FOR DATA SCIENCE.	BL3 APPLY
	CONSTRUCT THE BASIC JAVA API CLASSES IN APPLICATION PROGRAMMING.	BL3 APPLY			COLLECT, EXPLORE, CLEAN AND MANIPULATE DATA TO CONVERT IT INTO AN APPROPRIATE FORM.	BL2 UNDERSTAND
	APPLY CLIENT SERVER METHODOLOGY USING SOCKET PROGRAMMING IN JAVA, WEB APPLICATIONS USING JAVA LANGUAGE.	BL3 APPLY			IMPLEMENT MODELS SUCH AS K-NEAREST NEIGHBORS, NAIVE BAYES, LINEAR AND LOGISTIC REGRESSION, DECISION TREES, NEURAL NETWORKS AND CLUSTERING.	BL2 UNDERSTAND
	APPLY AND ANALYZE PLATFORM INDEPENDENT APPLICATION RUNTIME ENVIRONMENT TO CREATE STANDALONE GUI USING JAVA LANGUAGE.	BL3 APPLY			BUILD DATA SCIENCE APPLICATIONS USING PYTHON BASED TOOLKITS.	BL2 UNDERSTAND

	BUILD CONNECTION BETWEEN DIFFERENT TYPES OF DATABASES USING JAVA.	BL3 APPLY				
					IDENTIFY, INTERPRET & DEFINE A REALISTIC PROBLEM STATEMENT.	BL2 UNDERSTAND
					SELECT & APPLY AN APPROPRIATE TECHNIQUE TO CREATE A DESIGN.	BL3 APPLY
SELF LEARNING MODULE I (HSS) (SL31-20)	INTERPRET THE EFFECT OF VARIOUS SOCIAL PHENOMENA ON SOCIOLOGY	BL1 REMEMBER		**MINI PROJECT (CS327-20)**	CATEGORIZE THE IMPACT OF ENGINEERING SOLUTIONS IN A GLOBAL, ECONOMIC, ENVIRONMENTAL, AND SOCIETAL CONTEXT	BL4 ANALYZE
	ELABORATE THE ROLE OF URBANIZATION ON THE SOCIETY	BL2 UNDERSTAND			ANALYSE THE NEEDS TO MEET DESIRED WITHIN REALISTIC MULTIPLE CONSTRAINTS	BL4 ANALYZE
	APPRECIATE THE NEED OF SOCIAL INSTITUTIONS FOR BETTER SOCIETY.	BL2 UNDERSTAND			DEVELOP SOFT SKILLS INCLUDING PRESENTATION, WRITING & CONVINCING.	BL6 CREATE
	ASSESS THE ROLE OF MODERNIZATION, INDUSTRIALIZATION, ENVIRONMENTAL/ECOLOGICAL CHANGES IN THE DEVELOPMENT OF SOCIETY.	BL3 APPLY				
					DESIGN, DEVELOP AND APPLY STYLING TO A WEB-BASED APPLICATION.	BL3 APPLY
				SELF LEARNING MODULE II (CS328-20)	TO BE ABLE TO DESIGN RESPONSIVE WEB DESIGN.	BL3 APPLY
					BUILD EFFICIENT AND SCALABLE WEB API AND APPLICATION.	BL3 APPLY
					DEVELOP LIGHTWEIGHT BROWSER BASED FUNCTIONALITIES LEVERAGING CLIENT SIDE SCRIPTING FRAMEWORK	BL3 APPLY

FOURTH YEAR (2021-22)

SEMESTER-I

Distributed Systems CS411	DEFINE THE BASICS OF DISTRIBUTED SYSTEMS AND MIDDLEWARE.	BL1 REMEMBER
	EXPLAIN DISTRIBUTED SYSTEMS USING VARIOUS TECHNIQUES SUCH AS IPC, RMI, CORBA, RPC AND VARIOUS ARCHITECTURES USED TO DESIGN DISTRIBUTED SYSTEMS, SUCH AS CLIENT-SERVER AND PEER-TO-PEER.	BL2 UNDERSTAND
	DESIGN TYPICAL ALGORITHMS RELATED TO SYNCHRONIZATION AND DEADLOCK IN DISTRIBUTED SYSTEMS.	BL6 CREATE
	EVALUATE VARIOUS DISTRIBUTED MUTUAL EXCLUSION ALGORITHMS.	BL5 EVALUATE
	EVALUATE VARIOUS DISTRIBUTED DEADLOCK DETECTION ALGORITHMS AND APPLY KNOWLEDGE OF VARIOUS DISTRIBUTED FILE SYSTEM, ITS ARCHITECTURE AND WORKING FOR ACTIVE RESEARCH AT THE FOREFRONT OF THESE AREAS.	BL5 EVALUATE
	APPLY EMERGING TRENDS OF DISTRIBUTED SYSTEMS IN A SHARED MEMORY.	BL3 APPLY

SEMESTER-II

MANAGEMENT INFORMATION SYSTEM (CS421-21)	DEVELOP THE WEB PAGES USING HTML AND CSS.	BL3 APPLY
	DEVELOP THE RESPONSIVE WEB APPLICATIONS	BL3 APPLY
	SHOW THE FORMS AND VALIDATIONS FOR YOUR WEBSITE	BL2 UNDERSTAND
	CONSTRUCT THE STRUCTURE OF WEB PAGE, TO STORE THE DATA IN WEB DOCUMENT, AND TRANSPORT INFORMATION THROUGH WEB.	BL3 APPLY
	DEVELOP WEB APPLICATION USING CLIENT/SERVER SIDE SCRIPTING TECHNOLOGIES FOR A GIVEN PROBLEM.	BL3 APPLY
	DEVELOP SIMPLE WEB APPLICATION USING SERVER SIDE PHP PROGRAMING AND DATABASE CONNECTIVITY USING MYSQL.	BL3 APPLY

Machine Learning CS412	INTERPRET THE NEED AND APPLICATIONS OF MACHINE LEARNING.	BL2 UNDERSTAND
	BUILD MACHINE LEARNING MODEL FOR A GIVEN PROBLEM.	BL4 ANALYZE
	ANALYZE MACHINE LEARNING MODEL TO IMPROVE THEIR ACCURACY	BL4 ANALYZE
	VALIDATING MACHINE LEARNING MODEL	BL5 EVALUATE
	IMPROVING MACHINE LEARNING MODEL	BL5 EVALUATE
MODERN DATABASE SYSTEMS (CS413-21)	IMPLEMENT PRINCIPLES OF PARALLEL AND DISTRIBUTED DATABASE.	BL6 CREATE
	APPLY OBJECT-ORIENTED DESIGN PRINCIPLES FOR THE DATABASE DESIGN.	BL3 APPLY
	APPLY OLAP OPERATIONS ON A GIVEN DATA AND USE DATA MINING ALGORITHMS FOR PREDICTION.	BL3 APPLY
	USE QUERY EVALUATION AND QUERY OPTIMIZATION ALGORITHMS FOR QUERY PROCESSING.	BL5 EVALUATE
	DESCRIBE MODERN DATABASE TECHNOLOGIES FOR BIGDATA.	BL2 UNDERSTAND
SOFTWARE TESTING AND QUALITY ASSURANCE (CS414-21	UNDERSTAND WHAT A SOFTWARE BUG IS, HOW SERIOUS THEY CAN BE, AND WHY THEY OCCUR.	BL2 UNDERSTAND
	TEST SOFTWARE TO MEET QUALITY OBJECTIVES & REQUIREMENTS	BL5 EVALUATE
	APPLY TESTING SKILLS TO COMMON TESTING TASKS	BL3 APPLY
	PERFORM THE PLANNING AND DOCUMENTATION OF TEST EFFORTS	BL6 CREATE
	UNDERSTAND SOFTWARE QUALITY CONCEPTS, ASSURANCE & STANDARDS	BL2 UNDERSTAND
	USE TESTING TOOLS TO TEST SOFTWARE IN ORDER TO IMPROVE TEST EFFICIENCY WITH AUTOMATION	BL3 APPLY
	EXAMINE THE TYPES OF THE DATA TO BE MINED FOR A PARTICULAR APPLICATION.	BL4 ANALYZE

INFORMATION AND CYBER SECURITY (CS422-21)	EXPLAIN THE BASIC CONCEPTS OF CRYPTOGRAPHY	BL1 REMEMBER
	DISCUSS THE VARIOUS ENCRYPTION AND DECRYPTION TECHNIQUES	BL2 UNDERSTAND
	APPLY THE VARIOUS ALGORITHMS OF PUBLIC KEY CRYPTOGRAPHY	BL3 APPLY
	IDENTIFY INFORMATION SECURITY THREATS &VULNERABILITIES IN INFORMATION SYSTEM	BL2 UNDERSTAND
	DEMONSTRATE THE USE OF STANDARDS AND CYBER LAWS TO ENHANCE INFORMATION SECURITY IN THE DEVELOPMENT PROCESS AND INFRASTRUCTURE PROTECTION	BL3 APPLY
	DEMONSTRATE APPLICATION OF BLOCK CHAIN TECHNOLOGY	BL3 APPLY
ELECTIVE-IV BIG DATA ANALYTICS (CS423A-21)	ATIONS OF CONVENTIONAL DBMS AND RECOGNIZE NEED FOR BI	BL2 UNDERSTAND
	ROCESSING TECHNOLOGIES AND CHOOSE APPROPRIATE ONE FOI	BL4 ANALYZE
	USE VARIOUS BIG DATA TECHNOLOGIES FOR BIG DATA ANALYTICS	BL4 ANALYZE
	WRITE MAP REDUCE PROGRAM TO PROCESS BIG DATA.	BL1 REMEMBER
ELECTIVE-V : CLOUD COMPUTING (CS424A-21)	CHOOSE A CLOUD SERVICE DELIVERY MODEL SUITABLE FOR AN ORGANIZATIONâ€™S HARDWARE & SOFTWARE NEEDS.	BL3 APPLY
	CHOOSE A CLOUD DEPLOYMENT MODEL SUITABLE FOR AN ORGANIZATIONâ€™S HARDWARE & SOFTWARE NEEDS.	BL3 APPLY
	DETERMINE FINANCIAL IMPLICATIONS FOR SELECTING A CLOUD COMPUTING PLATFORM.	BL5 EVALUATE
	DETERMINE TECHNOLOGICAL IMPLICATIONS FOR SELECTING A CLOUD COMPUTING PLATFORM.	BL5 EVALUATE
	ADOPT SECURITY AND PRIVACY CONCERNS FOR A GIVEN CLOUD APPLICATION SCENARIO.	BL6 CREATE
	UNDERSTAND THE C# PROGRAMMING LANGUAGE.	BL2 UNDERSTAND

DATA MINING (CS415-21)	APPLY PREPROCESSING STATISTICAL METHODS FOR ANY GIVEN RAW DATA.	BL3 APPLY		**PROGRAMMING IN C#. NET (CS425-21)**	APPLY KNOWLEDGE OF THE STRUCTURE AND MODEL OF THE PROGRAMMING LANGUAGE C #.	BL3 APPLY
	SELECT AND APPLY PROPER DATA MINING ALGORITHMS TO BUILD ANALYTICAL APPLICATIONS.	BL1 REMEMBER			IMPLEMENT OBJECT-ORIENTED PROGRAMMING PARADIGM USING C# LANGUAGE.	BL3 APPLY
	STUDY THE ROLES THAT DATA MINING PLAYS IN VARIOUS FIELDS AND MANIPULATE DIFFERENT DATA MINING TECHNIQUES.	BL5 EVALUATE			DEMONSTRATE THE ABILITY TO USE .NET RUNTIME LIBRARY API TO PROVIDE A SOLUTION TO A GIVEN PROBLEM.	BL3 APPLY
	DEMONSTRATE AND APPLY A WIDE RANGE OF CLUSTERING, CLASSIFICATION AND ASSOCIATION RULE MINING ALGORITHMS.	BL5 EVALUATE			TEST AND DEBUG A C# PROGRAM FOR A GIVEN PROBLEM.	BL4 ANALYZE
	ANALYSIS OF WORKING OF WEB CRAWLERS, USAGE OF WEB AND OUTLIER DETECTION.	BL4 ANALYZE			DESIGN & CREATE APPLICATION TO CONNECT AND STORE DATA IN DIFFERENT TYPES OF DATABASES	BL6 CREATE
WEB TECHNOLOGY (CS416-21)	DESIGN WEB PAGES USING HTML, CSS AND JAVASCRIPT.	BL3 APPLY		**LAB II - PROJECT PHASE II (CS426-21)**	IDENTIFY, INTERPRET & DEFINE A REALISTIC PROBLEM STATEMENT.	BL2 UNDERSTAND
	ANALYZE REQUIREMENTS OF DEVELOPING WEB APPLICATIONS AND CHOOSE CLIENT OR SERVER SIDE SCRIPTING TECHNOLOGY.	BL4 ANALYZE			SELECT & APPLY AN APPROPRIATE TECHNIQUE TO CREATE A DESIGN.	BL3 APPLY
	ANALYZE CLIENT/SERVER SIDE SCRIPTING TECHNOLOGIES TO MEET REQUIREMENTS OF WEB APPLICATION AND CHOOSE AN APPROPRIATE ONE.	BL4 ANALYZE			CATEGORIZE THE IMPACT OF ENGINEERING SOLUTIONS IN A GLOBAL, ECONOMIC, ENVIRONMENTAL, AND SOCIETAL CONTEXT	BL4 ANALYZE
	BUILD EFFICIENT AND SCALABLE WEB APIS AND APPLICATIONS.	BL5 EVALUATE			ANALYSE THE NEEDS TO MEET DESIRED WITHIN REALISTIC MULTIPLE CONSTRAINTS	BL4 ANALYZE
	DEVELOP WEB APPLICATION USING CLIENT/SERVER SIDE SCRIPTING TECHNOLOGIES FOR A GIVEN PROBLEM.	BL6 CREATE			DEVELOP SOFT SKILLS INCLUDING PRESENTATION, WRITING & CONVINCING.	BL6 CREATE
	DEVELOP LIGHT WEIGHT BROWSER BASED FUNCTIONALITIES LEVERAGING CLIENT SIDE SCRIPTING FRAMEWORKS.	BL6 CREATE				
LAB I - PROJECT PHASE I (CS417-21)	IDENTIFY, INTERPRET & DEFINE A REALISTIC PROBLEM STATEMENT.	BL2 UNDERSTAND				
	SELECT & APPLY AN APPROPRIATE TECHNIQUE TO CREATE A DESIGN	BL3 APPLY				
	ANALYSE THE NEEDS TO MEET DESIRED WITHIN REALISTIC MULTIPLE CONSTRAINTS	BL4 ANALYZE				
	DEVELOP SOFT SKILLS INCLUDING PRESENTATION, WRITING & CONVINCING.	BL6 CREATE				
	CATEGORIZE THE IMPACT OF ENGINEERING SOLUTIONS IN A GLOBAL, ECONOMIC, ENVIRONMENTAL, AND SOCIETAL CONTEXT	BL4 ANALYZE				
	DENTIFY PROBLEM STATEMENT	BL2 UNDERSTAND				

VOCATIONAL TRAINING (CS418-19)	UNDERSTAND PROFESSIONAL ETHICS	BL2 UNDERSTAND				
	GET ANTIQUATED WITH LATEST TECHNOLOGIES	BL5 EVALUATE				
	DEVELOP PRESENTATION SKILLS	BL6 CREATE				

2.6.1

Programme and Course of the Programmes Offered by the Institution

DEPARTMENT OF ELECTRICAL ENGINEERING

SECOND YEAR

SEMESTER – I		
Course Name & Code	**Course Outcomes**	**Bloom's Level (No. and Name)**
Engineering Mathematics-III	Student can solve linear differential equations with constantcoefficients.	BL:3-Applying
	Student can reduce homogeneous and Legendre's linearequation to linear differential equation with constant coefficients and solve it.	BL:3-Applying
	Students are able to use or apply Laplace transform for gettingsolution for electric circuits.	BL:3-Applying
	Student can solve partial differential equations.	BL:3-Applying
	Student can solve Cauchy integral problems and complexintegration problems.	BL:3-Applying
	Students can compute Z - transform and Inverse Z – Transform.	BL:3-Applying
Electrical Machines-I	Explain the working principles, construction, and operation ofDC machines and single-phase and three-phase transformers.	BL-2- Explain
	Solve numerical problems and analyse the performance of DC machines through different characteristics.	BL-3- Solve & BL-4-Analyse
	Apply the knowledge of testing and applications of DC machines	BL-3- Apply
	Use different connections, develop the equivalent circuit andphasor diagram of transformers.	BL-3- Apply & BL-5-Develop
	Analyze the performance of transformers by conducting tests.	BL-4- Analyse
Electrical Measurement and Instrumentation	Define and apply the various characteristics of measuring instruments	BL1 & BL2-Understand
	Analyze the various parameters and draw the construction and working of different measuring instruments	BL2 & BL4

	Understand concept of potentiometer and Apply the fundamental measurement method of resistance, capacitance,inductance, frequency etc. by using various bridges with the help of bridge circuit and phasor diagram and other techniques .	BL2 & BL3
	Understand the various transducers for measurement of different parameters and apply the operation of CT and PT for different functions	BL2 and BL3
	Discuss the suitable applications of digital instruments	BL2
	Apply the operation of various oscilloscopes	BL2 & BL3
Power System I	•Student will be able to understand operation of different power plants	BL-2 Understand
	•Student will be able to analyze economic aspects of power system	BL-4 Analysis
	• Student will be able to investigate need and areas of application for non-conventional energy sources	BL-4 Analysis BL-3 Application
	• Students will be able to understand overhead structure of power system.	BL-2 Understand
Electronic Devicesand Circuits	Define & Apply Basic Terms Used In Power System Operation And Describe & Apply The Concept Of Load Curve And Tariff Methods.	Bl2- Understand
	Solve The Problems Of Single Stage Bjt Amplifier	Bl3-Apply
	Analyze Hybrid Equivalent Circuit Of Bipolar Junction Transistor	Bl4-Analyse
	Understand The Concept Of Field Effect Transistor	Bl2- Understand
	Apply The Concept Of Filter To Design Unregulated PowerSupply	Bl3 -Apply
	Classify Various Types Of Amplifiers	Bl4 -Analyze
Object Oriented Programming withC++	Student will be able to read, understand and analyze the simpleC++ Program	BL2-Understand
	Student will be able to apply principal of OOP concept and explore their skill to develop complex C++ program	BL2 -Understand
	Student will be able to apply various OOP functions to writeC++ program	BL3-Applying
	Student will be able to write the simple object oriented programs in C++ using objects and classes	BL3-Applying
	Student will able to understand and apply the concept of Inheritance to write C++ program	BL3-Applying

	Student will be able to develope the applictions using object oriented programming with C++	BL3-Applying

SEMESTER – II		
Course Name & Code	**Course Outcomes**	**Bloom's Level (No. and Name)**
Numerical Methods and Linear Algebra	To introduce to student to solve algebraic, transcendental and simultaneous linear equations by using various methods	BL-2 Understand
	To expose students to techniques of solving first order differential equation and simultaneous differential equation	BL:3-Applying
	To introduce the numerical methods for solving definite integrals	BL:3-Applying
	To develop the skills essential for solving matrix equations and to find linear transformation, also to understand the theory of vector spaces and column spaces	BL-2 Understand
	To introduce to student the theory of eigen values and eigen vectors.	BL:3-Applying
	To introduce to student orthogonality property and inner product concept	BL-2 Understand
Electrical Machines-II	Explain the working principles, construction and operation of three-phase, single-phase induction motors and synchronous machines	BL-2- Explain
	Compare characteristics, starting and speed control of induction motors.	BL-2- Compare
	Solve problems on induction motors and synchronous Machines	BL-3- Solve
	Analyze the performance of three-phase, single-phase induction motors and synchronous machines through the equivalent circuit and vector diagram.	BL-4- Analyse
Power System II	Analyze the concept of corona and sag	BL3 APPLY
	Understand and apply the knowledge of resistance, inductance & capacitance of transmission line (single phase and three phase),	BL3 APPLY
	Explain and use the knowledge of electrical, mechanical design of underground cables.	BL4 ANALYZE

	Analyze short, medium and long transmission line & calculate efficiency and regulation of short, medium & long lines.	BL4 ANALYZE
	Describe various power distribution systems & Calculate various parameters of power distribution systems	BL4 ANALYZE
	Summarize the components of substation equipments and methods of grounding	BL2 UNDERSTAND
Analog & Digital	Understand fundamentals of op amp and compare characteristics of ideal and practical op amp	BL2 UNDERSTAND
	Describe and analyze the concept open loop and closed loop configuration of op amp its applications	BL4 ANALYZE
	Understand the fundamentals of logic families.	BL2 UNDERSTAND
	Realize different combinational logic circuits	BL3 APPLY
	Analyze and Demonstrate synchronous and asynchronous sequential circuits using flip flops.	BL4 ANALYZE
Network Analysis	Solve network problems using mesh current and node voltage equations, theorems and two port network	BL3 APPLY
	Define and express the various electrical networks by graphical representation	BL2 UNDERSTAND
	Analyze the responses of first order and second order networks using time domain analysis	BL4 ANALYZE
	Examine and Analyze the circuit response using Laplace Transform	BL4 ANALYZE
	Examine and Analyze the circuit response using Laplace Transform	BL4 ANALYZE
Computer Aided Design [EL-226]	Handle Design and simulation software's for different applications in electrical engineering.	BL2: Understant
	Create and Design of Various devices used in electrical engineering	BL3: Application
	Simulate and Compute KCL, KVL and different network theorems	BL3: Application
	Analyze steady state condition of various electrical devices through simulation	BL4: Analysis

THIRD YEAR

SEMESTER-I		
Power System-III	**Explain** basic concepts of various powers, PU system and **Draw** single line diagram of given power system.	BL2 & BL1
	Analysing performance of power system during symmetrical fault and **select** proper circuit breaker under this fault condition	BL4
	Draw and **calculate** various sequence impedance and network for a given system.	BL1 & BL3
	Derive expression for fault current equation under unsymmetrical fault.	BL3
	Analyze power equation for the solution of different load flow problem.	BL4
	Analyze steady state and transient stability of power system using analytical method	BL4
Linear Control System	**Explain** basic terminologies, types, configurations and applications of control systems.	BL-2
	Derive mathematical model of physical systems	BL-3
	Determine the transfer function of a given control system through various techniques.	BL-3
	Compute the time response and **analyse** the performance through time domain specifications, error constants	BL-3 & BL-4
	Examine the stability of given system.	BL-3
	Analyse the performance and stability of control system in time and frequency domain.	BL-4
Microprocessor and Microcontroller	List features of 8085, draw and explain pin diagram and architecture of 8085.	BL1 REMEMBER, BL2 UNDERSTAND, BL3 APPLY
	Compare microprocessor and microcontroller , define embedded system state its characteristics , draw and and explain pin diagram and architecture of 8051 microcontroller .	BL1 REMEMBER, BL2 UNDERSTAND, BL3 APPLY, BL4 ANALYZE
	Understand different assembly language programming tools, explain addressing modes and instruction set of 8051.	BL2 UNDERSTAND, BL3 APPLY
	Analyze various interfacing techniques for IO and peripherals.	BL4 ANALYZE
	Draw the diagram and write a machine code to interface different electrical devices with 8051.	BL3 APPLY, BL4 ANALYZE

Electromagnetic Engineering	**Identify** and convert vectors in different co-ordinate systems. **Derive** expressions to calculate electric field intensity.	BL-1 BL-2&BL-3
	State and **apply** Gauss law, Divergence theorem and electric flux density. **Derive** expressions to solve numerical in electrostatic field.	BL-2 &BL-3
	Derive expression and **compute** numerical of ohm's law, Poisson's and Laplace's equation, boundary conditions for electric fields.	BL-3
	Explain and apply Biot-Savart law, Ampere's circuital law, Stoke's theorem and Lorentz force equation in magneto static field.	BL-2 &BL-3
	Define inductance and energy density in magnetic fields. **Derive** expression to calculate numerical on magnetic boundary conditions.	BL-1 &BL-3
	Derive Maxwell's equations in integral and point form for static, time varying and harmonically varying fields.	BL-3
Open Elective-I Managerial Economics	Explain the basic concepts of Managerial Economics	BL-2 Understand
	Relate the issue related to the demand, supply & market	BL-2 Understand
	Understand the use of diffrent tools for demand analysis& forecasting	BL:3-Applying
	Explain the production and cost function	BL-2 Understand
	Determine the price on the basis of market ,demand & supply	BL:3-Applying
Electrical Workshop	Understand different types of switches, sweachgears, meters, power supply, function generator, DSO, CRO	BL-2
	Study and apply different wiring systems	BL-1, BL-3
	Perform soldering and desoldering of components on PCB	BL-3

SEMESTER –II		
Electrical Machine Design	Explain the basic concepts related to the design of Electrical Machine	BL2: Understant
	Design the main dimensions & analyze the performance of single phase, three phase transformer	BL4: Analysis & BL5:Evaluate
	Estimate the main dimensions & analyze the performance of DC machine	BL4: Analysis & BL5:Evaluate
	Calculate the main dimensions & analyze the performance of Induction Motor	BL4: Analysis & BL5:Evaluate
	Design the main dimensions & analyze the performance of Synchronous machine	BL4: Analysis & BL5:Evaluate
Electrical Utilisation	**Introduce** different types of traction systems and **compute** speed time curves for different services	BL-1,2
	Define and **explain** different braking systems, selection of control and auxiliary equipment.	BL-1,2
	Explain concepts, operation and application of different types of motors and **choose** motor for particular application.	BL- 2,3
	Describe and **apply** modern learning techniques of heating and welding.	BL-2,3
	Discuss terms used in illumination and different types of lighting schemes	BL-2
	Explain the importance of Energy Conservation and maximizing the energy efficiency.	BL-2
Power Electronics (EL 323)	**Understand** the Principle of SCR & **Draw** its characteristics	BL1
	Understand the principal & operation of Various Power Electronic devices & **Draw** the Characteristics	BL1
	Understand the concepts & operating principles of phase controlled rectifiers, **Draw** the waveforms to each & **Analyse** the Average & R.M.S values.	BL1 & BL4
	Understand the concepts,operating principles of DC to DC converters & Analyse the DC-DC converters.	BL1 & BL4
	Understand the concepts, operating principles of inverters & **Analyze** inverter circuits	BL1 & BL4
	Understand the concepts,operating principles of AC to AC converters & **Analyze** AC to AC converters.	BL1 & BL4
Signals & Systems	Illustrate the types of basic signals and its properties	BL-2
	Classify the types of systems and its properties	BL-2
	Analyze LTI systems in the time domain using convolution and Examine their properties using impulse response	BL-4
	Examine system in frequency domain & their properties by using Z transform	BL-4

	Analyzing system in frequency domain & their properties by using Fourier transform	BL-4
	Evaluate DFT and FFT of DT signals	BL-5

Open Elective-II Advanced control System	**Design** and realize lead, lag, lag-lead compensators in time domain	BL-5
	Design various controller in frequency domain using Bode plot.	BL-5
	Examine the control system using modern approach.	BL-3
	Design the control system using modern approach.	BL-5
	Explain the nonlinear systems and **Analyze** their performance using various techniques.	BL-2 & BL-4
	Derive discrete-time mathematical models and **analyze** the transient and steady state performance	BL-3 & BL-4
Open Elective-II Sensors & Applications EL-325	**Elaborate** the concept of sensors and its characteristics.	BL-1
	State and Explain of working principle of analog and digital sensors.	BL-1 &BL-2
	Design sensor interface circuits for a given engineering problem.	BL-4
	Select an appropriate sensor for different engineering application	BL-1
	Describe the principle of sensor material and technology of a sensor.	BL-2
	Describe the working principle of different types of actuators.	BL-2
Mini Hardware Project	Understand, plan and execute a mini project with team.	BL-2, BL-3
	Device electronic hardware by implementing knowledge of PCB design techniques, soldering techniques and hardware debugging techniques	BL-3
	Prepare technical report based on the mini project	BL-3
	Estimate cost of the mini project, deliver technical seminar over mini project.	BL-6

FINAL YEAR

SEMESTER -I		
INDUSTRIAL DRIVES CONTROL (EL411)	UNDERSTAND THE PRINCIPLE AND OPERATION OF ELECTRICAL DRIVES.	BL1 REMEMBER, BL2 UNDERSTAND
	SELECT A DRIVE FOR A PARTICULAR APPLICATION BASED ON POWER RATING & BASED ON MECHANICAL CHARACTERISTICS FOR A PARTICULAR DRIVE APPLICATION.	BL1 REMEMBER
	EXPLAIN AND ANALYZE THE SPEED CONTROL OF DC MOTORS USING RECTIFIERS AND CHOPPERS ALSO DETERMINE THE MOTOR PARAMETERS.	BL2 UNDERSTAND, BL3 APPLY, BL4 ANALYZE
	UNDERSTAND AND EXPLAIN THE SPEED CONTROL OF INDUCTION MOTORS USING INVERTERS ALSO CALCULATE THE MOTOR PARAMETERS.	BL2 UNDERSTAND, BL4 ANALYZE
	UNDERSTAND THE CHARACTERISTICS AND EXPLAIN SPEED CONTROL OF SYNCHRONOUS & BLDC MOTOR DRIVES USING VSI.	BL1 REMEMBER, BL2 UNDERSTAND
	DESCRIBE THE STEPPER MOTOR DRIVES OPERATION & ITS CONVERTER CIRCUIT AND EXPLAIN SOLAR AND BATTERY-OPERATED OPERATION OF DRIVES.	BL1 REMEMBER, BL2 UNDERSTAND
POWER SYSTEM AND OPERATION CONTROL (EL412)	UNDERSTAND OPERATION AND CONTROL OF POWER SYSTEMS	BL1 REMEMBER, BL2 UNDERSTAND
	ANALYZE THE VARIOUS LOAD CHARACTERISTICS WITH LOAD CURVE AND LOAD DURATION CURVE	BL1 REMEMBER, BL2 UNDERSTAND, BL3 APPLY
	SOLVE ECONOMIC DISPATCH PROBLEMS AND UNIT COMMITMENT PROBLEMS IN POWER SYSTEM.	BL2 UNDERSTAND, BL3 APPLY, BL5 EVALUATE
	COMPREHEND THE DIFFERENT TECHNIQUES OF HIGH VOLTAGE MEASUREMENT.	BL2 UNDERSTAND, BL3 APPLY, BL5 EVALUATE
	EXPLAIN THE MODELING OF REACTIVE POWER-VOLTAGE INTERACTION AND THE CONTROL ACTIONS	BL2 UNDERSTAND, BL3 APPLY
	EXPLAIN THE CONCEPT OF REACTIVE POWER CONTROL AND VOLTAGE STABILITY	BL1 REMEMBER, BL2 UNDERSTAND

RENEWABLE ENERGY SOURCES (EL413)	DEMONSTRATE THE GENERATION OF ELECTRICITY FROM VARIOUS NON-CONVENTIONAL SOURCES OF ENERGY.	BL3 APPLY
	EXPLAIN THE SOLAR ENERGY COLLECTORS.	BL2 UNDERSTAND
	UNDERSTAND DIFFERENT METHODS FOR STORAGE OF SOLAR ENERGY & APPLICATION OF SOLAR ENERGY.	BL2 UNDERSTAND
	ANALYZE VARIOUS INTERFACING TECHNIQUES FOR IO ANDPERIPHERALS.	BL4 ANALYZE
	IDENTIFY WINDS ENERGY AS ALTERNATE FORM OF ENERGY AND TO KNOW HOW IT CAN BE TAPPED	BL1 REMEMBER, BL2 UNDERSTAND
	EXPLAIN BIO GAS GENERATION AND ITS IMPACT ON ENVIRONMENT	BL1 REMEMBER, BL2 UNDERSTAND, BL3 APPLY
	ILLUSTRATE OCEAN ENERGY AND EXPLAIN THE OPERATIONAL METHODS OF THEIR UTILIZATION	BL3 APPLY
	ACQUIRE THE KNOWLEDGE ON GEOTHERMAL ENERGY & DIRECT ENERGY CONVERSION.	BL3 APPLY
SWITCHGEAR AND PROTECTION (EL414)	UNDERSTAND AND APPLY OPERATING PRINCIPLES OF DIFFERENT RELAYS FOR PROTECTION.	BL1 REMEMBER, BL3 APPLY
	IDENTIFY AND EXPLAIN OVERCURRENT AND DIFFERENTIAL PROTECTION SCHEMES.	BL1 REMEMBER, BL2 UNDERSTAND
	RECOGNIZE DIFFERENT ZONES OF PROTECTION AND EXPLAIN DISTANCE PROTECTION SCHEMES.	BL1 REMEMBER, BL2 UNDERSTAND
	STUDY AND APPLY PROTECTION SCHEMES FOR DIFFERENT POWER SYSTEM EQUIPMENTS	BL1 REMEMBER, BL3 APPLY
	DISCUSS ARC INTERRUPTION METHODS IN CIRCUIT BREAKER.	BL2 UNDERSTAND
	STUDY AND COMPARE DIFFERENT TYPES OF CIRCUIT BREAKERS.	BL1 REMEMBER, BL2 UNDERSTAND
	DESCRIBE DIFFERENT TYPES OF OVERVOLTAGE PROTECTING EQUIPMENT.	BL2 UNDERSTAND

HIGH VOLTAGE ENGINEERING (EL415-21)	APPLY ELECTRIC FIELDS FUNDAMENTALS TO POWER SYSTEM & ANALYSE THE SURGE VOLTAGE DISTRIBUTION.	BL3 APPLY, BL4 ANALYZE
	DERIVE VARIOUS BREAKDOWN PHENOMENA & EVALUATE PRACTICAL CONSIDERATIONS IN GASES.	BL3 APPLY, BL5 EVALUATE
	UNDERSTAND CONDUCTION & BREAKDOWN IN LIQUIDS AS WELL AS COMPARE BETWEEN LIQUIDS & SOLIDS BREAKDOWN.	BL1 REMEMBER, BL4 ANALYZE
	COMPREHEND THE DIFFERENT TECHNIQUES OF HIGH VOLTAGE MEASUREMENT.	BL2 UNDERSTAND
	EXPLAIN THE PROCESS OF TESTING OF VARIOUS APPARATUS	BL2 UNDERSTAND
	UNDERSTAND THE USE OF VARIOUS TOOLS AND DEVICES FOR SIZING & RATING OF HIGH VOLTAGE LABORATORY	BL1 REMEMBER
PROJECT PHASE-I (EL417)	COLLECT INFORMATION, UNDERSTAND AND DESCRIBE IT.	BL1 REMEMBER
	WRITE TECHNICAL DOCUMENT TO REPRESENT AND IDENTIFY THE PROBLEM.	BL3 APPLY, BL4 ANALYZE
	SHOW THE ABILTY TO COMMUNICATE EFFECTIVELY AS AN INDIVIDUAL.	BL3 APPLY
	USE THE TECHNIQUES, SKILLS AND MODERN TOOLS.	BL3 APPLY
	UNDERSTAND PROFESSIONAL AND ETHICAL RESPONSIBILITY.	BL2 UNDERSTAND, BL4 ANALYZE

2.6.1

Programme and Course of the Programmes Offered by the Institution

DEPARTMENT OF ELECTRONICS & TELECOMMUNICATION
SECOND YEAR

SEMESTER-I		
Course Name & Code	**Course Outcomes**	**Bloom's Level**
Engineering Mathematics-III (ET211)	Apply concepts of higher order linear differential equations with constant coefficients to solve electrical circuits.	BL3: Apply
	Understand and solve the problems on Fourier series	BL3: Apply
	Understand the concept of correlation, regression and probability distribution	BL2: Understand
	Apply Laplace and inverse Laplace transforms to find the parameters of simple electrical circuits	BL3: Apply
	Apply numerical methods to solve linear equations	BL3: Apply
	Understand and solve the problems of Fourier integral and Fourier transform	BL2: Understand, BL3: Apply
Electronics Circuit Analysis and Design (ET212)	Explain construction and working of bipolar junction transistor and design single stage and multistage CE amplifier for given specifications	BL2: Understand, BL3: Apply
	Choose proper component values to construct feedback amplifier for given specifications.	BL3: Apply
	Choose proper component values to construct oscillators for given specifications.	BL3: Apply
	Describe working of different types of power amplifiers.	BL2: Understand
	Explain the working of JFET, MOSFET and applications of these devices.	BL2: Understand
Network Theory & Analysis (ET213)	Analyze linear circuit with use of different network theorems and analysis methods	BL3: Apply, BL4: Analyze
	Analyze series and parallel resonance circuits.	BL3: Apply, BL4: Analyze
	Compute two port network parameters and draw equivalent network.	BL3: Apply, BL4: Analyze
	Determine transient and steady state response of linear circuits.	BL3: Apply, BL4: Analyze
	Analyze network function for 1 and 2 port network.	BL3: Apply, BL4: Analyze
	Design passive filter and attenuator circuits.	BL3: Apply, BL4: Analyze
Digital Techniques (ET214)	Demonstrate the use of codes and k-map minimization, Quine- Mcclusky techniques in digital circuits.	BL2: Understand
	Realize combinational logic circuits using logic gates.	BL3: Apply
	Illustrate the use and significance of logic IC families and flip-flops in digital circuits.	BL2: Understand
	Use flip flops for building asynchronous and synchronous sequential circuits.	BL3: Apply
	Understand the concepts of synchronous state machines for designing digital applications	BL2: Understand
Analog Communication (ET215)	Explain the need and types of modulation.	BL2: Understand
	Calculate the noise in communication system	BL3: Apply
	Illustrate types of amplitude modulation and demodulation.	BL2: Understand
	Illustrate types of frequency modulation and demodulation.	BL2: Understand
	Use sampling techniques for analog pulse modulation and demodulation methods.	BL3: Apply
Electronic Software Lab-I (ET216)	Develop C++ programs and solve problems using procedure oriented approach.	BL2: Understand
	Develop C++ programs using classes and objects.	BL3: Apply

	Implement inheritance in C++ program.	BL3: Apply
	Use polymorphism in C++ language.	BL3: Apply
	Study and implement basics of python programming language.	BL2: Understand
SEMESTER-II		
Course Name & Code	**Course Outcomes**	**Bloom's Level**
Control System (ET221)	Analyze various control systems.	BL2: Understand
	Calculate transfer function and draw mathematical models for control systems.	BL3: Apply
	Obtain transfer function of systems using signal flow graph and block diagram reduction.	BL3: Apply
	Analyze control system in time domain.	BL4: Analyze
	Determine stability of systems.	BL4: Analyze
	Analyze control system in frequency domain and state space.	BL2: Understand
Analog Integrated Circuits (ET222)	Describe fundamentals of OP AMP and compare characteristics of ideal and practical OP-AMP.	BL3: Apply
	Understand and analyze frequency response of OP AMP.	BL3: Apply, BL4: Analyze
	Develop various linear and nonlinear applications of OP-AMP.	BL3: Apply
	Design first order and second order filters.	BL3: Apply, BL4: Analyze
	Understand and describe the concept of special ICs and its applications.	BL3: Apply
Principles of Digital Communication (ET223)	Describe & calculate information measures and apply source coding techniques for the memory less discrete sources.	BL2: Understand
	Explicate, demonstrate and analyze different pulse code modulation techniques.	BL2: Understand
	Explain, demonstrate and analyze binary and M-ary digital modulation techniques and compare them.	BL2: Understand
	Describe mathematical & analytical concepts of matched filter & correlation receivers and explain synchronization techniques.	BL2: Understand
	Apply binary block coding techniques for error detection & correction and estimate error detection & correction capabilities of block code.	BL3: Apply
Signals and Systems (ET224)	Represent different signals and systems mathematically and characterize their behavior graphically.	BL2: Understand
	Solve numerical on convolution integral, convolution sum and sampling theorem.	BL3: Apply
	Realize LTI system equations by using different forms.	BL3: Apply
	Calculate Fourier transform and plot amplitude and phase spectrum.	BL2: Understand
	Calculate ZT of a function and plot its ROC.	BL2: Understand
Data Structures (ET225)	Analyze the algorithms to determine the time and computation complexity and justify the correctness.	BL2: Understand
	Implement given search problem (linear search and binary search).	BL2: Understand
	Implement given problem of stacks, queues and linked list. Also, analyze the same to determine the time and computation complexity.	BL2: Understand
	Write an algorithm selection sort, bubble sort, insertion sort, quick sort, merge sort, heap sort and compare their performance in term of space and time complexity.	BL3: Apply
	Implement graph search and traversal algorithms and determine the time and computation complexity.	BL2: Understand
Electronic Software Lab-II (ET226)	Write python scripts using procedure and object oriented approach of writing a computer program	BL3: Apply

	Exhibit to use pythons standard library packages to provide solution to a given problems	BL3: Apply
	Test and debug python script for a given problem	BL5: Evaluate
Database Management Systems (HET21)	Apply the basic concepts of database system to design relational model and schemas.	BL3: Apply
	Design schema using ER model and normalization.	BL3: Apply
	Extract data using relational algebra and SQL.	BL3: Apply
	Access data using indexing and hashing techniques.	BL3: Apply
	Apply acid properties for transaction processing.	BL3: Apply
	Explain concurrency control and recovery methods.	BL2: Understand
THIRD YEAR		
SEMESTER-I		
Electromagnetic Field Theory (ET311)	Utilize the mathematical concepts in electromagnetic field	BL3: Apply
	Interpret the concepts and solve numerical of electrostatic field.	BL2: Understand
	Verify various laws of magneto static field.	BL4: Analyze
	Summarize Maxwell's equation to interpret wave propagation	BL2: Understand
	Analyze the electromagnetic wave propagation in different media.	BL4: Analyze
	Apply knowledge of smith chart to determine transmission line parameters.	BL3: Apply
Digital Design & HDL (ET312)	Explain different syntax of VHDL language.	BL2: Understand
	Design, simulate and analyze combinational and sequential logic circuits using VHDL.	BL3: Apply
	Design, simulate and analyze combinational logic circuits using Verilog.	BL3: Apply
	Explain different testing methods for combinational and sequential logic and write test bench for simple combinational circuit.	BL4: Analyze
	Describe architecture and internal components of CPLD, FPGA, ASIC and SOC and compare them.	BL2: Understand
Digital Signal Processing (ET313)	Solve problems based on correlation and DFT	BL3: Apply
	Analyze response of the system using linear filtering.	BL3: Apply
	Calculate FFT of the discrete signal.	BL3: Apply
	Calculate and analyze FIR & IIR filter coefficients using different techniques.	BL4: Analyze
	Realize transfer function of FIR & IIR filters using different methods	BL3: Apply
	Apply concepts of DSP in various applications	BL3: Apply
Microcontrollers and Applications (ET314)	Describe the fundamental features and operation of 8051 microcontroller	BL2: Understand
	Develop and practice assembly language or C-language programming techniques for 8051 microcontroller	BL3: Apply
	Interface various I/OS and peripherals with 8051 microcontroller	BL3: Apply
	Illustrate the various core and peripheral features for programming in pic 16F877 microcontroller	BL2: Understand
	Describe various communication protocols used in PIC 16F877 microcontroller	BL2: Understand
Business Ethics (ET315A)	Elaborate concept of ethics and related theories	BL2: Understand
	Describe and apply tools for decision making and management in business ethics	BL3: Apply
	Understand and form the ethical issues in corporation	BL2: Understand
	Understand and identify the ethical issues from various stakeholders point of context	BL2: Understand
	Understand the impacts of globalization on the nature and extent of the role played by civil society towards corporations	BL2: Understand

	Understand and identify the ethical issues in the relations between business and government	BL2: Understand
Electronic Software Lab-III (ET316)	Understand the basics of python language using concepts of C language.	BL2: Understand
	Interpret the fundamental python syntax and semantics.	BL5: Evaluate
	Apply the methods to create and manipulate python programs by utilizing the data structures like lists, dictionaries, and tuples	BL3: Apply
	Understand the python programming concepts such as encapsulation, inheritance, and polymorphism	BL2: Understand
Self-Learning Module-I (SLH31)	Demonstrate knowledge of ethical values in non-classroom activities.	BL2: Understand
	Identify the multiple ethical interests at stake in a real-world situation.	BL2: Understand
	Define human values and the social context of problems concerning research and intellectual contexts, academic integrity, use and citation of sources, the objective presentation of data, and the treatment of human subjects.	BL2: Understand
	Determine an ethical issue in the subject matter under investigation in the relevant field.	BL2: Understand
SEMESTER-II		
Antenna & Wave Propagation (ET321)	Understand the basic concepts of antenna and its parameters	BL2: Understand
	Analyze radiation pattern of various antenna	BL4: Analyze
	Determine various parameters of antenna	BL3: Apply
	Explain the types and application of antenna	BL2: Understand
	Discuss the characteristics of radio wave propagation	BL2: Understand
Embedded System (ET322)	Understand the basic concept of embedded system	BL2: Understand
	Explain the advanced arm core families architecture	BL2: Understand
	Illustrate the fundamentals of on chip peripheral of LPC2148	BL2: Understand
	Build a program for interfacing arm processor with input and output peripherals	BL3: Apply
	Make use of basic concept of basic concept of real time operating system like MCOSII	BL3: Apply
Electronic System Design (ET323)	Explain construction and working of different power semiconductor devices.	BL2: Understand
	Illustrate the use of power devices in industrial applications.	BL2: Understand
	Apply PLL for various control applications	BL3: Apply
	Illustrate the design of timer, frequency counter, digital voltmeter and signal conditioning circuit	BL4: Analyze
	Discuss the PLC based aspect for design of solving industrial problems.	BL2: Understand
Advanced Mobile Communication (ET324)	Explain the fundamentals of cellular system.	BL2: Understand
	Examine the mobile radio propagation.	BL3: Apply
	Differentiate the multiple access techniques used in mobile communication	BL2: Understand
	Illustrate the mobile technologies like GSM	BL2: Understand
	Discuss CDMA digital cellular standard (IS-95) & IMT – 2020	BL2: Understand
	Describe architecture of 4G & 5G technology	BL2: Understand
Optical Communication (ET325A)	Discuss the working of optical fiber.	BL2: Understand
	Demonstrate transmission characteristics of optical fibers.	BL3: Apply
	Calculate various parameters of optical sources & detectors.	BL3: Apply
	Explain the different types of optical network	BL2: Understand

	Analyze the functional blocks in optical communication system	BL2: Understand
Sensors & Applications (ET325B)	Describe characteristics and working principle of sensors.	BL2: Understand
	Use sensors to design interface circuits for various applications.	BL3: Apply
	Select an appropriate sensor for various applications.	BL4: Analyze
	Discuss various sensor materials and technology.	BL2: Understand
	Describe the working principle of different types of actuators.	BL2: Understand
Mini Hardware Project (ET326)	Identify problem statement based on literature survey	BL1: Remember
	Design circuit simulation and PCB artwork using EDA tool	BL2: Understand BL3: Apply
	Demonstrate soldering, testing, fault detection and effective trouble-shooting.	BL2: Understand BL3: Apply
	Demonstration of hardware based project with presentation.	BL2: Understand BL3: Apply
FOURTH YEAR		
SEMESTER-I		
Machine Learning (ET411)	Describe fundamental aspects of machine learning.	BL1: Remember
	Distinguish between various characteristics of ml	BL4: Analyze
	Explore classification and regression algorithms	BL3: Apply
	Design neural network for classification	BL5: Evaluate
	Design and implement different machine learning models	BL5: Evaluate
	Apply machine learning techniques that enable to solve real world problems.	BL3: Apply
Data Communication (ET412)	Understand basics of network layers & devices	BL2: Understand
	Explain the different protocols of data link layer	BL2: Understand
	Describe different wireless standards	BL2: Understand
	Elaborate the different network algorithms and protocols	BL2: Understand
	Illustrate the different IP address	BL3: Apply
	Demonstrate application of various protocols at different network levels.	BL3: Apply
Internet of Things (ET413)	Elaborate different components of an IOT system.	BL2: Understand
	Describe the architecture CORTEX M3 and classify series ARM	BL2: Understand
	Write interfacing program for different applications with ARM	BL3: Apply
	Compare different communication technologies and application protocols used in IOT.	BL4: Analyze
	Write different cloud platforms of IOT.	BL2: Understand
Database Management System (DBMS) (ET414)	Define and apply the basic concepts of database system, design, relational model and schemas.	BL1: Remember BL3: Apply
	Design principles for logical design of databases, including the ER method and normalization approach for any real time application.	BL6: Create
	Evaluate, using relational algebra and SQL, solutions to a broad range of query problems in a relational DBMS.	BL5: Evaluate
	Demonstrate an understanding of normalization theory and apply such knowledge to normalize a database.	BL3: Apply
	Compare the basic database storage structure & access techniques: indexing methods including B-tree and hashing	BL4: Analyze

	Familiar with the basic issues of transaction processing (ACID properties), different methods of concurrency control and recovery techniques.	BL2: Understand
Image & Video Processing (ET415A)	Understand the fundamentals of digital image processing.	BL2: Understand
	Apply mathematical tools for processing images	BL3: Apply
	Apply image enhancement techniques in time and frequency domain	BL3: Apply
	Apply image segmentation techniques	BL3: Apply
	Analyze images using basic image analysis techniques	BL4: Analyze
	Understand the various video processing techniques	BL2: Understand
Project Phase I (ET416)	Collect information, understand and describe it.	BL1: Remember
	Write technical document to represent and identify the problem.	BL3: Apply BL4: Analyze
	Show the ability to communicate effectively as an individual.	BL3: Apply
	Use the techniques, skills and modern tools.	BL3: Apply
	Understand professional and ethical responsibility.	BL2: Understand BL4: Analyze
Vocational Training (ET417)	Follow And Practice Industrial Norms	BL3: Apply
	Integrate Classroom Theory With Workplace Practice	BL3: Apply
	Develop New And Advance Skills	BL3: Apply
	Demonstrate Competency In Relevant Field Through Problem Identification, Formulation And Solution	BL3: Apply
SEMESTER-II		
Microwave Engineering (ET421)	Understand the importance of microwave engineering	BL1: Remember BL2: Understand
	Formulate the wave equation in the waveguide for analysis.	BL3: Apply
	Analysis of passive microwave components with given characteristics.	BL4: Analyze
	Show the ability to communicate effectively in team.	BL3: Apply
	Understand the working principles of all the microwave tubes and solid state devices.	BL1: Remember BL2: Understand
	Choose a suitable microwave measurement instrument and carry out the required measurements like impedance and VSWR	BL4: Analyze
CMOS VLSI Design (ET422)	Describe MOS transistor theory and it's behavioral characteristics	BL2: Understand
	Illustrate design rules and layouts for MOSFETs	BL3: Apply
	Demonstrate combinational logic circuits using CMOS	BL3: Apply
	Demonstrate sequential logic circuits using CMOS	BL3: Apply
	Analyze timing issues in digital circuits	BL4: Analyze
Artificial Intelligence & Applications (ET423B)	Apply problem solving approach using artificial intelligence	BL3: Apply
	Understand knowledge representation and reasoning	BL2: Understand
	Illustrate probabilistic language models for NLP using AI	BL3: Apply
	Use of AI in robotics	BL3: Apply
	Describe machine learning and deep learning for computer vision	BL2: Understand
Data Analytics (ET424B)	Explain the basic concepts of data analytics and its methodologies.	BL2: Understand
	Use different techniques to represent statistical data graphically	BL3: Apply
	Illustrate different methods to deal with data quality issues.	BL3: Apply
	Apply statistical techniques in the context of the open source r analytic software environment.	BL3: Apply

	Understand basics concept of big data and different visualization tools & techniques.	BL2: Understand
Project Phase II (ET425)	Identify, formulate and solves electronics and telecommunication engineering problems.	BL2: Understand
	Analyze and design the solution using design tools and techniques.	BL4: Analyze
	Develop ability to work on multidisciplinary level.	BL3: Apply
	Show the ability to communicate effectively in team.	BL3: Apply
	Understand the impact of engineering solutions in a global, economic, environmental and societal context.	BL2: Understand
	To perform as a individual and team members for effective execution of project.	BL3: Apply

2.6.1

Programme and Course of the Programmes Offered by the Institution

SEMESTER-I		
Course Name & Code	**Course Outcomes**	**Bloom's Level (No. and Name)**
C011 ENGINERING PHYSICS	Describe the concepts of semiconducting material and crystal structure.	BL-1 Remembering, BL-2 Understanding and BL-3 Applying
	Apply basic concepts of acoustics and ultrasonic in engineering field.	BL-1 Remembering, BL-2 Understanding
	Relate space, time, mass and energy equations.	BL-1 Remembering, BL-2 Understanding and BL-3 Applying
	Express the concepts of diffraction, polarization and can relate them to day to day observable phenomena.	BL-1 Remembering, BL-2 Understanding
	Explain the fundamental concepts, advantages and applications of laser and optical fiber in the field of science, engineering and medical.	BL-1 Remembering, BL-2 Understanding and BL-3 Applying
	Express the basic concepts of quantum mechanics and nanotechnology.	BL-1 Remembering, BL-2 Understanding
C112 ENGINEERING MATHEMATICS - I	Compute higher order derivative of standard functions and verify Mean Value Theorems.	BL-1 Remembering, BL-2 Understanding and BL-3 Applying
	Describe the power series expansion of a given function and evaluate limits	BL-1 Remembering, BL-2 Understanding and BL-3 Applying
	Apply matrices techniques for solving system simultaneous linear equations, Eigen values and Eigen vectors of the matrix	BL-1 Remembering, BL-2 Understanding and BL-3 Applying
	Evaluate Multivariable derivatives and can implement to estimate maxima and minima of multivariable function	BL-1 Remembering, BL-2 Understanding and BL-3 Applying
	Compute velocity vector, gradient, divergence, curl and applications.	BL-1 Remembering, BL-2 Understanding and BL-3 Applying
C113 BASICS OF CIVIL AND MECHANICAL ENGINEERING	Describe the role of civil engineer in the development of the society and Relationship of civil engineering with other branches of engineering and technology.	BL-1 Remembering, BL-2 Understanding
	Explain various elements of Environment & Water Resources Management, transportation engineering, buildings, concepts of Green Buildings, Remote sensing Techniques, GIS &GPS.	BL-1 Remembering, BL-2 Understanding
	Identify power producing/absorbing systems and related transmission systems.	BL-1 Remembering, BL-2 Understanding and BL-3 Applying

	Explain various machining/joining processes implemented in everyday life.	BL-1 Remembering, BL-2 Understanding and BL-3 Applying
	To determine heat and work quantum during different thermodynamic processes.	BL-1 Remembering, BL-2 Understanding and BL-3 Applying
C114 ENGINEERING MECHANICS	Apply fundamentals of Engineering Mechanics for analyzing effects of a system forces acting on a rigid body.	BL-1 Remembering, BL-2 Understanding and BL-3 Applying, BL-4 Analyze
	Analyze various types of statically determinate beams, pin jointed trusses by analytical and graphical methods.	BL-1 Remembering, BL-2 Understanding and BL-3 Applying, BL-4 Analyze
	Locate centroid and centre of Gravity and calculate moment of Inertia of plane lamina.	BL-1 Remembering, BL-2 Understanding and BL-3 Applying, BL-4 Analyze
	Apply knowledge of Kinematics and Kinetics of rigid body motion to solve problems of bodies in motion.	BL-1 Remembering, BL-2 Understanding and BL-3 Applying, BL-4 Analyze
	Use Work Energy methods for analyzing linear and rotational motion.	BL-1 Remembering, BL-2 Understanding and BL-3 Applying, BL-4 Analyze

C115 UNIVERSAL HUMAN VALUES	Appreciate the essential complementarily between 'VALUES' and 'SKILLS' to ensure sustained happiness and prosperity, which are the core aspirations of all human beings.	BL-1 Remembering, BL-2 Understanding
	Develop holistic perspective towards life and profession as well as towards happiness and prosperity based on a correct understanding of the Human reality and the rest of Existence.	BL-1 Remembering, BL-2 Understanding
	Appreciate the Universal Human Values and movement towards value-based living in a natural way.	BL-1 Remembering, BL-2 Understanding
	Highlight ethical human conduct, trustful and mutually fulfilling human behavior and mutually enriching interaction with Nature.	BL-1 Remembering, BL-2 Understanding
C116 COMMUNICATION SKILLS	Frame grammatically correct sentences for day to day Communication.	BL-2 Understanding and BL-3 Applying, Creating
	Use numerous appropriate words and sentences in written communication.	BL-2 Understanding and BL-3 Applying, Creating
	Demonstrate effective oral communication skills in various situations.	BL-2 Understanding and BL-3 Applying, Creating
	Read, comprehend and answer the questions based on a passage.	BL-2 Understanding and BL-3 Applying, Creating

	Draft letters, emails, write paragraphs and essays with appropriate content and context.	BL-2 Understanding and BL-3 Applying, Creating
	Solve verbal ability questions in competitive exams	BL-2 Understanding and BL-3 Applying, Creating
C117 CREATIVITY AND DESIGN THINKING	Relate with and Compare the various learning styles and memory techniques and Apply them in their engineering education.	BL-1 Remembering, BL-2 Understanding and BL-3 Applying,
	Analyze emotional experience and Experiment with emotional expressivity to better understand users while designing products.	BL-1 Remembering, BL-2 Understanding and BL-3 Applying,
	Appreciate the importance creativity and design thinking, Develop new ways of thinking and Learn the innovation cycle for creating innovative products.	BL-1 Remembering, BL-2 Understanding and BL-3 Applying,
	Understand individual differences and its impact on everyday decisions so as to demonstrate frameworks, strategies, techniques while creating innovative products.	BL-1 Remembering, BL-2 Understanding and BL-3 Applying,
	Develop skills for evaluating, articulating, refining, and creating an innovative engineering product that solves customer problems(s).	BL-1 Remembering, BL-2 Understanding and BL-3 Applying,

C118 WORKSHOP PRACTICE	Identify various hardware and software components of a computer and compare between them.	Perception (LI), Set L2), Guided response(L3, Mechanism (L4)
	Assemble a desktop from components supplied and Setup a working desktop system using a Raspberry Pi board.	Perception (LI), Set L2), Guided response(L3, Mechanism (L4)
	Identify and use various electronic components and instruments.	Perception (LI), Set L2), Guided response(L3, Mechanism (L4)
	Develop basic electronic circuits on breadboards.	Perception (LI), Set L2), Guided response(L3, Mechanism (L4)
	Demonstrate the use of an Arduino board using basic circuits.	Perception (LI), Set L2), Guided response(L3, Mechanism (L4)
	Prepare different shaped metal work piece joints from the given metal blanks by selecting different tools and machines.	Perception (LI), Set L2), Guided response(L3, Mechanism (L4)
	Perform different types of welding of metal components.	Perception (LI), Set L2), Guided response(L3, Mechanism (L4)
	Select different engineering tools required to perform, fitting, machining, welding and joining processes.	Perception (LI), Set L2), Guided response(L3, Mechanism (L4)

SEMESTER-II		
Course Name & Code	**Course Outcomes**	**Bloom's Level (No. and Name)**
C122 ENGINEERING MATHEMATICS -II	Solve first order ordinary differential equation and able to apply in different Engineering applications.	BL-1 Remembering, BL-2 Understanding and BL-3 Applying
	Test divergence & convergence of infinite series.	BL-1 Remembering, BL-2 Understanding and BL-3 Applying
	Use the tools of differentiation of functions of a complex variable that are used in various techniques dealing engineering problems.	BL-1 Remembering, BL-2 Understanding and BL-3 Applying
	Draw approximate shape of planer curve with justification.	BL-1 Remembering, BL-2 Understanding and BL-3 Applying
	Evaluate improper and multiple integrals and their usage.	BL-1 Remembering, BL-2 Understanding and BL-3 Applying
C123 BASIC ELECTRICAL AND ELECTRONICS ENGINEERING	Apply the various simplification methods to analyze dc circuits.	BL-1 Remembering, BL-2 Understanding and BL-3 Applying
	Use the concept of magnetic circuits to calculate parameters of magnetic circuits and single phase transformer.	BL-1 Remembering, BL-2 Understanding and BL-3 Applying
	Apply knowledge of ac fundamentals and poly phase to analyze ac circuits.	BL-1 Remembering, BL-2 Understanding and BL-3 Applying
	Explain working, characteristics and applications of diode and BJT.	BL-1 Remembering, BL-2 Understanding and BL-3 Applying
	Select appropriate transducers to measure various physical parameters like distance, temperature etc.	BL-1 Remembering, BL-2 Understanding and BL-3 Applying
	Perform arithmetic operations on digital number system.	BL-1 Remembering, BL-2 Understanding and BL-3 Applying
C124 PROGRAMMING	Design the flowcharts and algorithms for the given problem .	BL-2 Understanding and BL-3 Applying,
FOR PROBLEM SOLVING	Translate the algorithms into C programs and test & execute the programs.	BL-2 Understanding and BL-3 Applying,
	Implement C programs by appropriately selecting control and loop structures.	BL-2 Understanding and BL-3 Applying,
	Implement C programs using functions and pointers.	BL-2 Understanding and BL-3 Applying,
	Implement C programs using arrays, structure and unions and files.	BL-2 Understanding and BL-3 Applying,
	Develop small applications using C Programming concepts.	BL-2 Understanding and BL-3 Applying,

C125 ENGINEERING GRAPHICS AND CAD	Draw projection of lines and planes for engineering applications.	BL-1 Remembering, BL-2 Understanding and BL-3 Applying,
	Draw regular and sectional views of various types of solids.	BL-1 Remembering, BL-2 Understanding and BL-3 Applying,
	Draw the 2 D view (orthogonal views) given 3D drawing.	BL-1 Remembering, BL-2 Understanding and BL-3 Applying,
	Draw the development of the regular and truncated solids.	BL-1 Remembering, BL-2 Understanding and BL-3 Applying,
	Draft the 2-D drawing of machine components.	BL-1 Remembering, BL-2 Understanding and BL-3 Applying,
C126 PROFESSIONAL COMMUNICATION	Prepare good quality presentation and deliver it effectively.	Remembering, understanding, applying, evaluating, creating
	Participate effectively in group discussion	Remembering, understanding, applying, evaluating, creating
	Perform effectively in personal interview	Remembering, understanding, applying, evaluating, creating
	Prepare effective resume for job interviews	Remembering, understanding, applying, evaluating, creating
	Draft and write various reports professionally.	Remembering, understanding, applying, evaluating, creating
	Demonstrate various soft skills like team skills, leadership, creativity, etc. in different situations.	Remembering, understanding, applying, evaluating, creating

SVERI's COLLEGE OF ENGINEERING, PANDHARPUR

Engineering for Excellence

PROGRAMME OUTCOMES AND COURSE OUTCOMES

Department of Mechanical Engineering

PROGRAMME OUTCOMES

1. .

DEPARTMENT OF MECHANICAL ENGINEERING

Students graduating from Mechanical Engineering will demonstrate:

1. **Engineering knowledge:** apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
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. **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. **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. **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. **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. **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. **Ethics:** apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:**function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
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. **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. **Life-long learning:** recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES

DEPARTMENT OF MECHANICAL ENGINEERING

Mechanical Engineering Graduates will be able to:

1. Design a system, component or process to meet desired needs within realistic constraints such as economic, environmental, social, regulatory, ethical, health and safety, manufacturability and sustainability.
2. Design and conduct experiments, as well as to analyze and interpret data, in different areas of Design Engineering, Heat Power, Renewable Energy, Automation, Industrial Engineering, Manufacturing and related Management.
3. Use techniques, skills and upcoming software, machine tools and processes necessary in the practice of Mechanical Engineering profession.

COURSE OUTCOMES

DEPARTMENT OF MECHANICAL ENGINEERING

SECOND YEAR

SEMESTER - I		
Course Name & Code	**Course Outcomes**	**Bloom's Level**
Applied Thermodynamics (ME211)	Apply basic laws of thermodynamics to engineering applications.	BL3 Apply
	Make use of steam tables & mollier diagram forsolving thermodynamic problems.	BL3 Apply
	Classify boilers and compare vapor powar cycles andfind various performance parameters.	BL2 Understand
	Determine performance of steam nozzles and explain condensers with their construction & working.	BL3 Apply
	Classify steam turbines and calculate their performance parameters.	BL3 Apply
	Describe reciprocating air compressor and calculate its performance.	BL3 Apply
Mechanics of Materials (ME212)	Determine the stresses, strains and deformation under various axial, torsional and flexural loading.	BL5 Evaluate
	Determine strain energy in axially loaded members	BL5 Evaluate
	Calculate principal stresses & position planes in a member subjected to various types of stress system by analytical & graphical method.	BL5 Evaluate
	Calculate principal stresses & position planes in a member subjected to various types of stress systemby analytical & graphical method.	BL5 Evaluate
	Determine torsional shear stress, angle of twist &design dimensions of shaft.	BL5 Evaluate
	Draw s.f.d, b.m.d and determine shear & bendingstresses, slope and deflection in various types of beams & sections.	BL5 Evaluate
Manufacturing Processes (ME213)	Select appropriate manufacturing process for a given component.	BL3 Apply
	Understand performance of each process.	BL2 Understand
	Prepare manufacturing plan for the given component	BL3 Apply
	Explain the methods adopted for their performance improvement.	BL2 Understand
	Performance analysis different types of Manufacturing processes.	BL3 Apply

Machine Drawing & CAD (ME214)	Recall knowledge regarding basics of machine drawing and bis conventions	BL1 Remember
	Construct free hand sketching of machine components.	BL3 Apply
	Relate the significance of auxiliary view and draw auxiliary views.	BL2 Understand
	List the significance and identify problems based on limits, fits and tolerances.	BL1 Remember
	Construct assembly, details drawing and identify applications of same.	BL3 Apply
	Construct 3-d drawing by using isometric projection method.	BL3 Apply
Internal Combustion Engines (ME215)	Distinguish between the different types of engine constructions and their thermodynamic principles.	BL2 Understand
	Differentiate the working principles and constructional details of various fuel systems used in different types of i. C. Engines.	BL3 Apply
	Explain the methods adopted for their performance improvement.	BL3 Apply
	Correlate the difference in si and ci engine combustion processes with the design of combustion chambers used in these engines.	BL3 Apply
	Performance analysis different types of i. C. Engines.	BL4 Analyze
	Develop the understanding of alternative fuels for i. C. Engines and i.c. engines pollution.	BL3 Apply

SEMESTER - II		
Course Name & Code	**Course Outcomes**	**Bloom's Level**
Engineering Mathematics-III (ME221)	Student can solve partial differential equation of first order	BL3 Apply
	Student can express a function in terms of sine and cosine components so as to model	BL3 Apply
	Student can use numerical methods for evaluating definite integrals.	BL3 Apply
	Student can use numerical methods for solving linear and non-linear equations.	BL2 Understand
	Student can sketch and explain various probability distribution functions.	BL2 Understand
	Students can use correlation concept in dat to day life and estimate lines of regression	BL2 Understand
Manufacturing Technology (ME222)	Apply different mechanisms, accessories, attachments and operations of lathe machine.	BL3 Apply
	Understand and analyze frequency response of op amp	BL3 Apply
	Make use of reciprocating machine tools	BL3 Apply
	Experiments with different operations of milling machine and solve indexing problems..	BL3 Apply
	Make use of grinding machine tools.	BL3 Apply
	Explain and compare the concept of unconventional machining processes.	BL3 Apply
Fluid Mechanics & Fluid Machines (ME223)	Explain total pressure, center of pressure on plane and curved surfaces encountered in damstructures, and metacentric height of floating & submerged body in a static fluid.	BL2 Understand
	Identify types of fluid flow and calculate velocity, acceleration, stream function andvelocity potential at any point in the fluid flow.	BL3 Apply
	Illustrate different flow measurement devices& energy lossess in a pipe network using darcy weis-batch and empirical formulae.	BL2 Understand
	Construct mathematical correlation for fluid flow phenomenon in terms of dimensionless parameters & find out forces on immersed bodies.	BL3 Apply
	Solve impulse & reaction turbine for itsvarious design parameters.	BL3 Apply
	Make use of different operating parameters of centrifugal pump for finding its performance.	BL3 Apply

Kinematics & Theory of Machines (ME224)	Distinguish between the different mechanismsand draw velocity and acceleration diagram for different mechanisms.	BL2 Understand
	Predict cam profiles required for different motions of followers in different applicationsusing graphical method.	BL3 Apply
	Examine different parameters of brake dynamics.	BL3 Apply
	Identify and evaluate gear trains used in different power transmission applications	BL3 Apply
	Illustrate use of control devices such as governor and gyroscope in variousapplications.	BL3 Apply
	Perform balancing of rotating and reciprocating masses.	BL3 Apply
Power Plant Engineering (ME225)	Get basic knowledge for effective use of available energy sources by suitable planningof power generation in thermal, hydro, gas & atomic power plant.	BL2 Understand
	Describe energy conversion on power plants &describe role of various organization ofpower plants	BL2 Understand
	Explain load curves and load factors.	BL3 Apply
	Explain calculation of fixed & operating cost.	BL3 Apply
	Study the classification of wind energy conversion systems (wecs).	BL2 Understand
	Explain duties & responsibilities of energy auditors.	BL2 Understand
Mechanical Workshop-I (ME226)	Operate Different Machines Such As Lathe, Drilling, Milling, Grinding, etc.	BL2 Understand
	Demonstrate the understanding of process of manufacturing the component as per drawing and specifications.	BL2 Understand
	Differentiate between metal machining and composite machining.	BL2 Understand
Electrical Technology (ME227)	Develop the capability to identify and selectsuitable dc motors / ac motors for given applications in mechanical engineering	BL1 Remember
	Explain starting and determine speed-torque characteristics of electrical motors	BL2 Understand
	Describe and apply the concept of electricalheating and welding in manufacturing processe	BL2 Understand
	Discuss the concepts of digital circuits and usethese concepts in digital design	BL3 Apply
	Apply the concept of signal conditioning and explain the various applications of operational amplifier.	BL3 Apply
	Explain the fundamentals of microcontroller8051 and write its industrial applications.	BL1 Remember

THIRD YEAR

SEMESTER -I		
Machine Design –I (ME311)	Explain material Selection, Factor of safety, theories of failure and general design procedure.	BL4 Analyse
	Analysis of Design parameters of Simple Mechanical Parts under static and fluctuatingloading conditions.	BL4 Analyse
	Select and design proper belt and spring forvarious applications.	BL3 Apply
	Apply design considerations for casting, forging, assembly, manufacturing, non-metals, and environment.	BL4 Analyse
	Analysis of Design parameters of shafts, keys and couplings.	BL4 Analyse
	Analysis of Design parameters of welded, rivetedand bolted joint under various loading conditions.	BL4 Analyse
CAD-CAM & CAE (ME312)	Describe the concept of modern product cycle	BL2 Understand
	Apply knowledge of the fundamental mathematical theories for geometrictransformation.	BL3 Apply
	Apply cae analysis tool for simulation of 1-d component.	BL3 Apply
	Explain the concept of gt, capp and fms	BL2 Understand
	Select appropriate tooling for cnc machine.	BL4 Anlyze
	Outline part programming to operate cnc milling & turning machine to manufacture a mechanical part.bl4 analyze	BL4 Anlyze
Metallurgy (ME313)	Demonstrate relevance of principles of physical metallurgy and its significance.	BL2 Understand
	Identify and make use of various ferrous materialsfor engineering applications.	BL3 Apply
	Identify and make use of nonferrous alloys & advanced materials for engineering applications.	BL3 Apply
	Apply the knowledge for selection of proper heat treatment process for obtaining desired properties.	BL3 Apply
	Make use of suitable destructive and non-destructive methods for material testing.	BL3 Apply
	Utilize the powder metallurgy process for manufacturing of products.	BL3 Apply

Industrial Engineering and Operation Research (ME314)	Analyse and measure productivity.	BL4 Anlyze
	Perform method study and work measurement.	BL3 Apply
	Describe optimization process and OR models.	BL2 Understand
	Apply and develop various optimization techniques and prepare project plan for industrial applications.	BL3 Apply
Non-Conventional Machining (ME315) (Professional Elective-III)	Summarize different non-conventional machining processes.	BL 2 Understand
	Select the suitable non-conventional machining process based on mechanical energy source for suitable materials.	BL 4 Analyse
	Examine the Electric Discharge Machining (EDM) and Wire cut EDM processes and their applications.	BL 3 Apply
	Explain working principle, process parameters and applications of Chemical machining, Electro-Chemical machining, and Photochemical Machining.	BL 2 Understand
	Categorize different non-conventional processes based on thermal energy source and their applications.	BL 4 Analyse
	Discuss different coating methods like Metal Spraying, Metallic coating, Plasma flame spraying.	BL 2 Understand

SEMESTER –II		
Machine Design –II (ME321)	Calculate design parameters of spur gear and helical gear under different loading condition.	BL3 Apply
	Apply the design principles for pressure vessel design.	BL3 Apply
	To undestand basic terms related to statistical considerations in design.	BL2 Understand
	To deisgn the bevel gear.	BL3 Apply
	To deisgn the worm gear.	BL3 Apply
	To select bearing from manufacturer's catalogue.	BL3 Apply
Instrumentation & Control (ME322)	Students will understand the design & construction of measuring instruments.	BL2 Understand
	Students will setup the Instruments & accessories for measurement of properties by avoiding	BL3 Apply
	Students will calibrate the simple instruments using more accurate standards.	BL3 Apply
	Describe construction, functioning and application of various measuring instruments	BL4 Analyse
	Design control systems and draw block diagrams	BL3 Apply
	Analyze root locus diagram, Bode plot and discuss stability of mechanical system.	BL4 Analyse
Heat Transfer (ME323)	Apply 1-D heat conduction equations to solve wall, Cylinder, Sphere Problems.	BL3 Apply
	Analyze Heat transfer rate, Effectiveness & Efficiency in various cases of the fins.	BL4 Anlyze
	Apply different laws related to radiation for calculation ofheat transfer rate.	BL3 Apply
	Determine heat transfer coefficient associated with different geometries by considering natural and forcedconvection**.**	BL3 Apply
	Explain the boiling Curves and Types of Condensation.	BL2 Understand
	Analyze heat exchanger with the help of LMTD and NTU method.	BL4 Anlyze
Industrial & Quality Management (ME324)	Outline the different aspects of management for bettermentof organization.	BL4 Anlyze
	Illustrate the concept of Planning, organizing & staffing.	BL3 Apply
	Illustrate the concept of leading and controlling.	BL3 Apply
	Summarize the elements of quality along with its specifications.	BL2 Understand
	Select different quality control tools.	BL4 Anlyze
	Select different charts to check the quality of new products.	BL4 Anlyze

Plastic Engineering (ME325) (Professional Elective-IV)	Select the plastic materials for particular end user applications.	BL 3 Apply
	Suggest the suitable plastic molding process and welding technique for the end user application.	BL 3 Apply
	Design simple plastic components for end use application.	BL 3 Apply
	Design simple compression mold.	BL 3 Apply
	Design simple injection mold and gating system.	BL 3 Apply
	Calculate heat dissipated, mass flow rate of cooling medium and cooling time required.	BL 3 Apply
Mini Project (ME326)	To identify potential problems in engineering.	BL 2 Understand
	To provide a solution for the problem identified.	BL 3 Apply
	To express technical ideas, strategies and methodologies in written form.	BL 3 Apply
Metrology (ME327)	To illustrate the theoretical concepts taught in Mechanical Measurements & Metrology through experiments.	BL 3 Apply
	To illustrate the use of various measuring tools measuring techniques.	BL 3 Apply
	To understand calibration techniques of various measuring devices.	BL 3 Apply
Mechanical Workshop –III (ME328)	To set the manufacturing set up of different machining operations and study the corresponding set up parameters while working on actual machine tools.	BL 3 Apply
	To select appropriate and proper process parameter for obtaining desired requirement on work piece.	BL 3 Apply
	To identify the operational / processing problems andsuggest remedial solution for adopted manufacturing processes.	BL 3 Apply

FOURTH YEAR

SEMESTER -I		
Automatic Control Engineering (ME411)	Formulate mathematical model for different types ofcontrol systems.	BL2 Understand
	Compare the systems with the help of block diagram reduction rules to obtain closed loop transferfunction.	BL3 Apply
	Examine the modes of control in accordance with output of control system.	BL3 Apply
	Analyze transient response of the systems, steady state conditions and characteristics of a system whenit is in equilibrium state.	BL4 Anlyze
	Analyze root locus diagram, bode plot and discussstability of mechanical system.	BL4 Anlyze
	Evaluate state space techniques for representingcontrol systems.	BL5 Evaluate
Refrigeration and Air Conditioning (ME412)	Analyze various types of refrigeration systems such as vapour compression, air refrigeration, multi compression & multi-evaporative.	BL4 Anlyze
	Select refrigerants for different refrigeration systems.	BL3 Apply
	Explain various types of vapour absorption refrigerationsystems.	BL2 Understand
	Explain various psychrometric terms, psychrometric processes & factors forming load on air conditioning systems	BL2 Understand
	Make use of knowledge of human comfort & duct designwhile designing of air conditioning systems.	BL3 Apply
	Apply knowledge of contemporary issues in the area of refrigeration & air conditioning	BL3 Apply
Operation Research (ME413)	Choose operations research models & solve linear programming problems.	BL3 Apply
	Apply the optimization principles to solve assignmentand transportation problems.	BL3 Apply
	Analyze the strategies of operations research to solvegames & sequencing problems	BL4 Anlyze
	Build replacement model for getting life of machine	BL3 Apply
	Choose appropriate tools to solve the industrial problemsrelated to inventory analysis.	BL3 Apply
	Analyze operations research models for scheduling the projects.	BL4 Anlyze

Automobile Engineering (ME414-1)	Compare the different vehicle layouts and body styles.	BL2 Understand
	Calculate the performance parameters of the vehicle such as resistance to vehicle, gear box ratio, accelerationetc.	BL4 Anlyze
	Select and explain the different transmission systemcomponents for efficient power transmission.	BL3 Apply
	Explain the working of different electrical and electronic systems and their use in modern automobiles.	BL3 Apply
	Analyze the different parameters influencing the automobile control systems such as steering and braking system	BL3 Apply
	Explain the different suspension systems used in automobiles.	BL2 Understand
Production and Operational Management (ME-414-2)	Explain the various types of the production systems,scope and need of production and operation management.	BL2 Understand
	Illustrate the needs and types of forecasting methods and determine the future demands using different forecasting methods.	BL3 Apply
	Discuss the concept of capacity planning, and its elements, importance and measures.	BL2 Understand
	Examine the production planning & control and inventory control in production process and its elements.	BL3 Apply
	Categorize different phases of plant maintenance.	BL4 Anlyze
	Describe the modern elements of production systemslike value engineering, value analysis, six sigma, kanban, and computer aided production management. Etc.	BL2 Understand
	Select financial institutions for establishing new enterprise.	BL3 Apply
Project Work-I (ME416)	Identify, interpret, and solve problems in mechanical engineering.	BL2 Understand
	Analyze and predict the systems using design tools and techniques.	BL3 Apply
	Categorize the impact of engineering solutions in a global, economic, environmental, and societal context	BL4 Anlyze
	Analyse the needs to meet desired within realisticmultiple constraints	BL4 Anlyze
	Demonstrate the ability to work on multidisciplinary level.	BL3 Apply
	Demonstrate the leadership ability to communicate effectively in team	BL3 Apply

Industrial Training (ME417)	To understand industrial culture & organizational setup.	BL2 Understand
	To understand technical report writing and presentation.	BL2 Understand
	To apply theoretical knowledge with the actual in industry	BL3 Apply
	To understand responsibility and role of engineer in industry	BL2 Understand

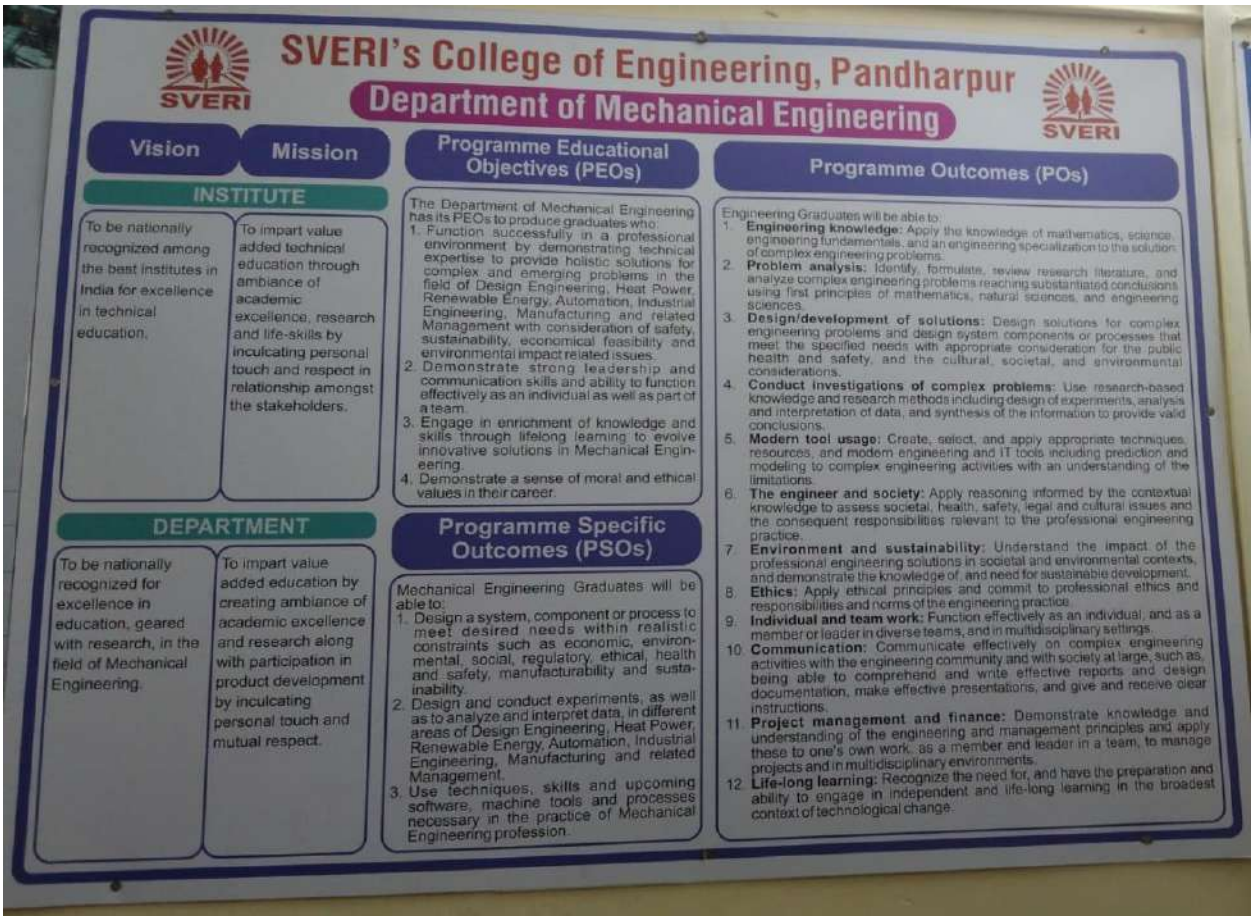
SEMESTER – II		
Industrial Engineering(ME421)	Introduce industrial engineering. Analyze and evaluatethe productivity	BL4 Anlyze
	Make use method study to reduce down time in the production using different recording techniques.	BL3 Apply
	Explain ergonomics concepts for industrial safety	BL5 Evaluate
	Determine the standard time required for a job	BL5 Evaluate
	Recommendation of types layout need for particular production	BL5 Evaluate
	Evaluate the job merit rating and valuation of job	BL5 Evaluate
Industrial &Quality Management(ME422)	Outline the different aspects of management for betterment of organization.	BL4 Anlyze
	Illustrate the concept of organizing, staffing, leading and controlling.	BL4 Anlyze
	Break down the functions of various basic departments in organization	BL4 Anlyze
	Summarize the elements of quality along with itsspecifications	BL2 Understand
	Select different quality control tools and charts to checkthe quality of new products	BL4 Anlyze
	Outline the aspects of iso 9000, iso 14000 and requirements of iso 9001.	BL4 Anlyze
Non-Conventional Machining (ME-423-A)	Summarize different non-conventional machiningprocesses.	BL2 Understand
	Select the suitable non-conventional machining process based on mechanical energy source for suitable materials.	BL4 Anlyze
	Examine the electric discharge machining (edm) and wirecut edm processes and their applications.	BL3 Apply
	Explain working principle, process parameters and applications of chemical machining, electro-chemical machining, and photo-chemical machining.	BL2 Understand
	Categorize different non-conventional processes based on thermal energy source and their applications.	BL4 Anlyze
	Discuss different coating methods like metal spraying, metallic coating, plasma flame spraying.	BL2 Understand
Marketing Management (ME-424)	To familiarize with marketing, marketing management,the marketing environment and marketing planning process.	BL2 Understand
	To get acquainted with new marketing trends, market segmentation and consumer behavior.	BL2 Understand
	To study the components of the marketing mix; identifyhow the firms marketing strategy, product and price mix evolve and adapt to match consumer behavior and perceptions of the product.	BL3 Apply
	To study the components of the place and promotion mix; identify how the firms marketing strategy, place and promotion mix evolve and adapt to match consumer behavior and perceptions of the product	BL3 Apply

Project Work-II(ME425)	Analyze & summarize the collected information in the form of literature review.	BL4 Anlyze
	Analyze, design and synthesize systems/ processes to solve societal, environmental & public health problems.	BL4 Anlyze
	Select and use modern tools to understand impact of professional engineering solutions in a global, economical, environmental contexts, etc.	BL4 Anlyze
	Perform effectively as an individual or in a team by following professional ethics.	BL5 Evaluate
	Develop the ability to communicate effectively to comprehend and write professional documents such as research paper, project reports, etc.	BL6 Create
	Integrate engineering & management principles to manage projects and to engage in life long learning as per the need of change in technology.	BL6 Create

Dissemination of Programmes Outcomesand Course Outcomes to Teachers and Students

Display of PO's and PSO's at the HOD Cabin

Department of Mechanical Engineering.



SVERI's College of Engineering, Pandharpur

Department of Mechanical Engineering

Vision

INSTITUTE

To be nationally recognized among the best institutes in India for excellence in technical education.

Mission

To impart value added technical education through ambiance of academic excellence, research and life-skills by inculcating personal touch and respect in relationship amongst the stakeholders.

DEPARTMENT

To be nationally recognized for excellence in education, geared with research, in the field of Mechanical Engineering.

To impart value added education by creating ambiance of academic excellence and research along with participation in product development by inculcating personal touch and mutual respect.

Programme Educational Objectives (PEOs)

The Department of Mechanical Engineering has its PEOs to produce graduates who:

1. Function successfully in a professional environment by demonstrating technical expertise to provide holistic solutions for complex and emerging problems in the field of Design Engineering, Heat Power, Renewable Energy, Automation, Industrial Engineering, Manufacturing and related Management with consideration of safety, sustainability, economical feasibility and environmental impact related issues.
2. Demonstrate strong leadership and communication skills and ability to function effectively as an individual as well as part of a team.
3. Engage in enrichment of knowledge and skills through lifelong learning to evolve innovative solutions in Mechanical Engineering.
4. Demonstrate a sense of moral and ethical values in their career.

Programme Specific Outcomes (PSOs)

Mechanical Engineering Graduates will be able to:

1. Design a system, component or process to meet desired needs within realistic constraints such as economic, environmental, social, regulatory, ethical, health and safety, manufacturability and sustainability.
2. Design and conduct experiments, as well as to analyze and interpret data, in different areas of Design Engineering, Heat Power, Renewable Energy, Automation, Industrial Engineering, Manufacturing and related Management.
3. Use techniques, skills and upcoming software, machine tools and processes necessary in the practice of Mechanical Engineering profession.

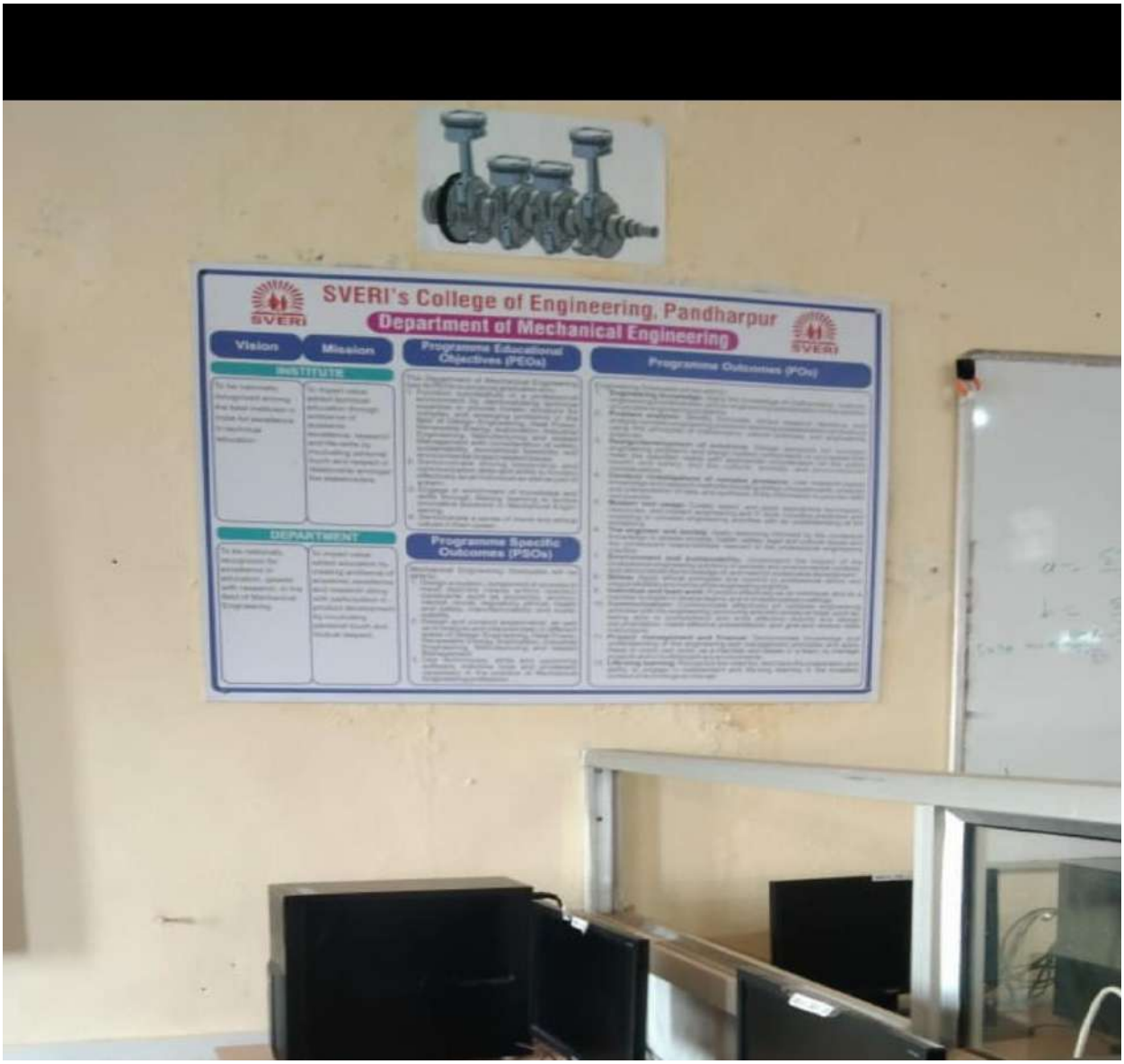
Programme Outcomes (POs)

Engineering Graduates will be able to:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
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. **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. **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. **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. **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. **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. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
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. **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. **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.

Display of PO's and PSO's at the Lab

Department of Mechanical Engineering.



NBA Accreditation

"All eligible UG Programs are accreditated by the "**National Board of Accreditation (NBA)**"
(The highest accreditating body for the International Quality Standards in Engineering & Technology)

Shri Vithal Education & Research Institute's

COLLEGE OF ENGINEERING, PANDHARPUR

P.B.No.54, Gopalpur - Ranjani Road, Gopalpur, Pandharpur - 413304, **District**: Solapur (Maharashtra)
Tel.: (02186) 216063, 9503103757, **Toll Free No.**: 1800-3000-4131 **e-mail.**: coe@sveri.ac.in
Website.: www.sveri.ac.in Accredited by The Institution of Engineers (India), Kolkata and TCS, Pune.
NBA Accredited all eligible UG Programmes, **NAAC** Accreditated Institute,ISO 9001:2015 Certified Institute.
(Approved by A.I.C.T.E., New Delhi and Affiliated to Punyashlok Ahilyadevi Holkar Solapur University, Solapur)

ASSIGNMENTS / TUTORIALS BOOK

Name Gundeti Arun Ambadas **Exam. Seat No.** _____

Class T. Y - B **Semester** VI **Roll No.** 29

Subject Instruementation & Controls

SVERI

Engineering for Excellence

SVERI's COLLEGE OF ENGINEERING
PANDHARPUR

OUR VISION

To be nationally recognized among the best institutes in India for excellence in technical education.

OUR MISSION

To impart value added technical education through ambiance of academic excellence, research and life - skills by inculcating personal touch and respect in relationship amongst the stakeholders.

OBJECTIVES

- To achieve a status of premier technological institute.
- To achieve excellence on Academic, Administrative and Personality Development fronts through our own channelized pattern of teaching learning process.
- To develop the State of the Art, Research, Development and Consultancy Cell.
- To strengthen Industry Institute Interaction to provide industrial exposure to the students and upgradation of faculty knowledge about advanced trends.

QUALITY POLICY

We are committed for academic and overall development of our student -

- By effective implementation of teaching learning process.
- By establishing respectful and pleasant behavior with the students and inculcation of culture of patience and co-operation.
- By providing ample opportunities for personality development.
- By creating environment conducive to learning.

(Dr. B. P. RONGE)
PRINCIPAL

INDEX

(Assignment / Tutorial Book Assessment)

Sr. No.	Title of Assignment / Tutorial	Page No.	CO	Date of Assign./Tut.		Marks (25)			Total Marks (25)	Sign.
				Given	Checked	Timely Submission (10)	Presentation (10)	Oral (5)		
01	Assignment NO:- 1									
	Pressure & Temp.	01	01	22/03	30/03	10	10	4	24	
	Measurement									
02	Assignment NO:- 2	02	02							
	Force & Torque			30/3	15/04	10	10	4	24	
	Measurement									
03	Assignment NO:- 3	04	03	15/04	29/04	10	10	4	24	
	Acceleration, Velocity									
	& Displacement									
04	Assignment NO:- 4	06	04	29/04	12/05	10	10	4	24	
	Control System									
05	Assignment NO:-5	08	05	12/05	26/05	10	10	4	24	
	Root locus Method									
06	Assignment NO :-6	09	06	26/05	07/06	10	10	4	24	
	Bode Plots									

CERTIFICATE

This is certify that Mr. / Miss. / Mrs. Gundeti Arun Ambadas of

Class T.Y. Division B Roll No 29 Semester VI has completed satisfactorily

Assignments/Tutorials in I & C during the academic year 21-22

Date :

Subject Teacher | Head of Dept. | Principal

CO No.	CO Statement	BL	PI Code
ME322.1	Describe construction, functioning & application of various measuring instruement	3	1.1.2 2.2.1
ME322.2	Design control systems & Draw Block diagram	4	2.3.1
ME322.3	Analyze root locus diagram Bode plot & Discuss stability of Mechanical system	4	3.1.2
ME322.4	Design of control system of Automatic & Mannual	3	4.1.4 4.1.3
ME322.5	Analyze of Root Locus Method	4	3.1.4
ME322.6	Analyze of Bode Plotes & controller system	4	3.3.2

Vision

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To impart value added education by creating ambiance of academic excellence and research along with participation in product development by inculcating personal touch and mutual respect.

Programme Educational Objectives (PEOs)

The Department of Mechanical Engineering has its PEOs to produce graduates who:

1. Function successfully in a professional environment by demonstrating technical expertise to provide holistic solutions for complex and emerging problems in the field of Design Engineering, Heat Power, Renewable Energy, Automation, Industrial Engineering, Manufacturing and related Management with consideration of safety, sustainability, economical feasibility and environmental impact related issues.
2. Demonstrate strong leadership and communication skills and ability to function effectively as an individual as well as part of a team.
3. Engage in enrichment of knowledge and skills through lifelong learning to evolve innovative solutions in Mechanical Engineering.
4. Demonstrate a sense of moral and ethical values in their career.

Programme Specific Outcomes(PSOs)

Mechanical Engineering Graduates will be able to:

1. Design a system, component or process to meet desired needs within realistic constraints such as economic, environmental, social, regulatory, ethical, health and safety, manufacturability and sustainability.
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Accredited by The Institution of Engineers (India), Kolkata and TCS, Pune.

LAB WORKBOOK

Name Kadam D. S. **Exam. Seat No.** 01 15 31

Class T. Y **Semester** VI th **Roll No.** 04

Subject metrology

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(Dr. B. P. RONGE)
PRINCIPAL

INDEX

(Laboratory Book Assessment)

Sr. No.	Title of Experiment	Page No.	CO	Date of Expt.		Marks (25)					Total (25)	Sign.
				Performed	Submitted	Attendance (5)	Performance (5)	Submission (5)	Presentation (5)	Oral (5)		
1.	Assignment No. 01	1		08/3	11/3	5	5	5	5	4	24	
2.	Assignment No. - 02	11		21/3	21/3	5	5	5	5	4	24	
	Practicals											
	Calibration of Vernier caliper micrometer											
1.	Practical No. 01 dial indicator using slip gauge	15	1	28/3	11/4	5	5	5	5	4	24	
2.	Measurement of gear Practical No. 02 tooth thickness using gear tooth vernier caliper measure effective dia	18	2	11/4	21/4	5	5	5	5	4	24	
3.	Practical No. 03 screw thread by using Profile Projector	21	3	21/4	21/5	5	5	5	5	4	24	
4.	To measure surface roughness Practical No. 04 of given sample using taylor Wobsofs taly surf	22	4	21/5	13/5	5	5	5	5	4	24	
5	Practical No. 05											
5.	Visit to Metrology lab.	24	5	13/5	27/5	5	5	5	5	4	24	

CERTIFICATE

This is certify that Mr. / Miss. / Mrs. Kadam Dipti Santosh of

Class T.Y. Division B Roll No 04 Semester VI th has completed satisfactorily

Experiments in Metrology during the academic year 2021-22

Date :

Subject Teacher | Head of Dept. | Principal

CO No.	CO Statement	BL	PI Code
1	Understand the method of measurement & selection measuring instrument, std. of measurement	2	1.2.1 3.2.1
2	Identify & apply various measuring instruments.	3	3.2.1
3	Explain tolerance, limits of size, fits, geometric & position tolerance & gouge design.	4	1.4.1
4	Calibrate measuring instruments & also design inspection gauges.	5	4.1.4
5	Distinguish betn linear & angular dimensions measuring instruments & explain their applⁿ.	4	3.3.1
6	Understand the advances in metrology such as use of profile projector & roughness tester.	3	3.2.1 4.1.4

Department of Mechanical Engineering

Vision

To be nationally recognized for excellence in education, geared with research, in the field of Mechanical Engineering.

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3. Use techniques, skills and upcoming software, machine tools and processes necessary in the practice of Mechanical Engineering profession.

INDEX

Name : Kale Shubham Shankar Sub.: ~~HMT~~ I C engine

Std.: T E Div.: B Roll No.: 20

Sr. No.	Date	Title	Page No.
		Introduction to teacher	
		Name - S V Jadhav	
		Quali^{n} - B E (Automobile)	
		M Tech (Energy engg)	
		Ph D (Mech. engg persuing)	
		Experien	
		Industrial - 2 year	
		Teaching - 21 yer	

Date : / /
Page No.:

Institute
vision - To be recognised among the best institute in India for excellance in technical edu°

Dept
vision - To be nationally recognised for excellance in edu° geared with research in the field of meth engg.

Institute mission - To impart value added technical educa° through ambiance of academic excellance, research & life skills by including personal touch & respect in rel° among stakeholders.

Dept mission - To impart valur added edu° by creating ambiance of academic excellance & research along with participation in product developement by including personal touch & respect

PEO's —
The dept of meth engg has PEOs to produce graduates who:
① Function successfully in professional environment by demostrating technical expertise to provide holistic sol° for complex & emerging problem in the field of design engg, heat power, renewable energy, automation, industrial engg, manufacturing & related management with safety

Date: / /
Page No.:

② Demostrate strong leadership & communication skill & the ability to function effectively as an individual as well as part of team
③ Engage in enrichment of knowledge & skill thr life long learning
④ Demostrate a sense of moral & ethical values in their career

PO's :—

① Apply the knowledge of maths, science engg fundamentals & engg specialization to solve complex problem
② Identify, formulate, review, research literature & analyze complex engg problem reching sustainable conclusion using 1st principal of maths, engg science
③ Design sol^n for complex engg problem & system component or processes that meet the specified needs with appropriate consideration for the public health & safety
④ Use research based knowledge & research method including design of experiment, analysis & interpretation of data & synthesis of inform to valid conclusion
⑤ Modern tool usage - IT tools
⑥ Apply reasoning informed by the contextual knowledge to access societal health safety

Date : / /
Page No.:

(7) Understand the impact of professional engg. sol" in societal & environmental context & demonstrate the knowledge of need for sustainable development
(8) Apply ethical principles & commit to professional ethics & responsibilities & norms of engg practice.
(9) Function effectively as an individual & as a member in diverse team & in multidisciplem settings.
(10) Communicate effectively on complex engg activities with engg community & as society at large such as being able to comprehend & write effective report & design document make effectiv presentatin & give recm
(11) Project management & finance.
(12) Life long learning.

PSO's -

(1) Design a system, component or process to meet desired needs within realistic constrains such as economic, environmental social, regulatory, ethical, health & safety, sustainability.
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