



	CO Statements	POs												PSOs			
CO3	List out the biodiversity of India, threats and its conservation methods.	-	-	-	-	-	1	3	-	-	-	-	-	-	-	-	-
CO4	Explain the different types of pollutions and their control technologies, Waste water treatment, Bio medical waste management etc.	-	-	2	-	-	2	3	-	-	-	-	-	-	-	-	-
CO5	Explain EIA- Environmental Impact Assessment, Sustainable developmental activities, environmental policies and regulations	-	-	2	-	-	2	3	-	-	-	-	-	-	-	-	-
Course Code	<b>171BS1T03 - ENGINEERING CHEMISTRY</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	
CO1	Explain polymeric materials their uses and moulding techniques of plastics.	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
CO2	Analyse fuel characteristics using Calorific value, knocking characteristics and flue gas analysis.	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
CO3	Explain the working principle of Electro chemical cells and corrosion characteristics.	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
CO4	Explain the properties and applications of Nano, Superconductors, Semiconductors, Liquid crystals and fuel cells.	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
CO5	Summarize water purification techniques and boiler troubles.	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Course Code	<b>171ES1T02 - ENGINEERING MECHANICS</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	
CO1	Determine the resultant force and moment for a given force system.	3	2	1	-	-	-	-	-	-	-	-	-	-	-	-	
CO2	Explain the concept of friction.	2	1	1	-	-	-	-	-	-	-	-	-	-	-	-	
CO3	Calculate the forces in planar and spatial systems.	3	2	1	-	-	-	-	-	-	-	-	-	-	-	-	
CO4	Locate centroid of composite areas and centre of gravity of composite bodies.	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	
CO5	Calculate the moment of inertia of composite areas and rigid bodies.	3	2	1	-	-	-	-	-	-	-	-	-	-	-	-	
CO6	Apply the concepts of kinematics, kinetics, work - energy and impulse - momentum methods to particle motion.	3	2	1	-	-	-	-	-	-	-	-	-	-	-	-	
Course Code	<b>171ES1T01 -COMPUTER PROGRAMMING</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	
CO1	Apply fundamental of C for mathematical and scientific problems.	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	
CO2	Use Control Structures, Arrays and strings in solving complex problems.	1	2	2	3	-	-	-	-	-	-	-	-	-	-	-	
CO3	Develop modular programs to solve problems using functions.	1	3	2	2	-	-	-	-	-	-	-	-	-	-	-	
CO4	Demonstrate the pointers concept for allocating and deallocating memory dynamically.	1	2	2	3	-	-	-	-	-	-	-	-	-	-	-	
CO5	Solve real world problems using the concept of files, structures and unions.	1	2	2	2	-	-	-	-	-	-	-	-	-	-	-	
Course Code	<b>171HS1L01 - ENGLISH COMMUNICATION SKILLS LAB- I</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	
CO1	Make use of the concepts to communicate confidently and competently in English Language in all spheres.	-	-	-	-	1	-	-	-	-	3	-	1	-	-	-	





	CO Statements	POs												PSOs			
CO4	Compare the operation of 3-phase alternator and 3-phase induction motors.	2	1	-	-	-	-	2	-	-	-	-	-	-	-	-	-
CO5	Distinguish the operation of half wave, full wave bridge rectifiers, and types of transistors.	3	1	2	2	-	-	1	-	-	-	-	-	-	-	-	-
Course Code	<b>171HS2L02 - ENGLISH COMMUNICATION SKILLS LAB- II</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	
CO1	Make effective use of Body language in all situations and contexts to enhance effective communication in all aspects.	-	-	-	-	-	-	-	-	-	3	-	2	-	-	-	
CO2	Identify communicative competency to respond to others in different situations.	-	-	-	-	-	-	-	-	-	3	-	2	-	-	-	
CO3	Make use of effective delivery strategies to select, compile and synthesize information for oral presentation.	-	-	-	-	-	-	-	-	-	3	-	2	-	-	-	
CO4	Demonstrate in mock interviews, group discussion and public speaking.	-	-	-	-	-	-	-	-	-	3	-	2	-	-	-	
CO5	Illustrate interpersonal skills using English language confidently and effectively for personal and professional growth.	-	-	-	-	-	-	-	-	-	3	-	2	-	-	-	
Course Code	<b>171BS2L02 - ENGINEERING PHYSICS LAB</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	
CO1	Use spectrometer, polarimeter, travelling microscope for making measurements.	3	2	-	-	-	-	-	-	1	-	-	1	-	-	-	
CO2	Determine energy gap of a semiconductor, draw characteristic curves to estimate thermal coefficient of a thermistor, zener diode.	2	2	-	-	-	-	-	-	1	-	-	1	-	-	-	
CO3	Determine the rigidity and determine frequency of an unknown electric vibrator.	3	1	-	-	-	-	-	-	1	-	-	1	-	-	-	
CO4	Determine wavelength of unknown source, the width of narrow slits, spacing Between close rulings using lasers and appreciate the accuracy in measurements.	3	2	-	-	-	-	-	-	1	-	-	1	-	-	-	
CO5	Verify magnetic field along the axis of a circular coil.	3	2	-	-	-	-	-	-	1	-	-	1	-	-	-	
Course Code	<b>171ES2L02 - ENGINEERING WORKSHOP AND IT WORKSHOP</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	
CO1	Prepare carpentry, fitting joints as per the given requirement using Carpentry and Fitting tools	2	1	-	-	-	-	-	-	1	-	-	-	-	-	-	
CO2	Convert the metal rods and sheets into final shape using black smithy and tin smithy tools	2	1	-	-	-	-	-	-	1	-	-	-	-	-	-	
CO3	Prepare the circuit for house wiring applications	2	1	-	-	-	-	-	-	1	-	-	-	-	-	-	
CO4	Install the operating system software , networking and troubleshoot the problems	2	1	-	-	-	-	-	-	1	-	-	1	-	-	-	
CO5	Develop documents using MS-Office and LaTeX tools	2	1	-	-	-	-	-	-	1	-	-	1	-	-	-	



	CO Statements	POs												PSOs		
Course Code		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
	<b>171MI3T03 - MINING GEOLOGY - I</b>															
CO1	Analyze applications of geology in mining.	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-
CO2	Classify the minerals based on properties	2	-	-	-	-	-	-	-	-	-	-	-	3	-	-
CO3	Apply the knowledge on igneous rocks in mining	1	3	-	-	-	-	-	-	-	-	-	-	3	-	-
CO4	Compare the properties on sedimentary and Metamorphic rocks	1	3	-	-	-	-	-	-	-	-	-	-	3	-	-
CO5	Apply the knowledge of mineralogy in mining	2	1	-	-	-	-	-	-	-	-	-	-	2	-	-
	<b>171ME3T01 - COMPUTER AIDED ENGINEERING DRAWING PRACTICE</b>															
Course Code		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Construct the projection of solids inclined to both the planes.	1	-	-	-	-	-	-	-	-	2	-	-	-	-	-
CO2	Draw the sectional view of the solids.	1	-	-	-	-	-	-	-	-	2	-	-	-	-	-
CO3	Develop the surfaces of regular solids- prism, pyramid, cone and cylinder.	1	-	-	-	-	-	-	-	-	2	-	-	-	-	-
CO4	Practice the intersection of solids and perspective of projection.	1	-	-	-	3	-	-	-	-	2	-	1	-	-	-
CO5	Draw the isometric and or thographic Projections of the machine parts through CAD software's	1	-	-	-	3	-	-	-	-	2	-	1	-	-	-
	<b>171ES3L12 - ELECTRICAL AND ELECTRONICS LAB</b>															
Course Code		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Illustrate the efficiency of a a DC machines, transformer and 3-Phase induction motor	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	Apply Synchronous impedance method to Pre-determine the regulation of an alternator	3	-	1	1	-	-	-	-	-	-	-	-	-	-	-
CO3	Apply the Field flux control method & Armature Voltage control method to Control the speed of a DC shunt motor	3	2	1	1	-	-	-	-	-	-	-	-	-	-	-
CO4	Explain the working of PN junction diode, BJT and CE amplifier	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO5	Develop rectifier circuits for signal conversion from AC to DC	3	-	1	1	-	-	-	-	-	-	-	-	-	-	-
CO6	Explain the simple mathematical operations using Operational Amplifier- IC-741(inverting, non inverting, integrator and differentiator)	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-
	<b>171ES3L13 - BASIC MECHANICAL ENGINEERING LAB</b>															
Course Code		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Calculate the coefficient of discharge for venturimeter of pipes and orificemeter.	2	1	-	-	-	-	-	-	1	-	-	1	-	-	-
CO2	Estimate the head losses in pipe flow.	2	1	-	-	-	-	-	-	1	-	-	1	-	-	-
CO3	Analyse the performance characteristics of impulse of reaction turbines.	2	1	-	-	-	-	-	-	1	-	-	1	-	-	-
CO4	Determine the coefficient of discharge slip and efficiency of Reciprocating Pump.	2	1	-	-	-	-	-	-	1	-	-	1	-	-	-
CO5	Analyse the performance of characteristics of single stage and multi-stage centrifugal pumps	2	1	-	-	-	-	-	-	1	-	-	1	-	-	-

CO Statements		POs												PSOs		
Course Code	171HS3A09 - PROFESSIONAL ETHICS & HUMAN VALUES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Make use of values, morals and ethics in their day to day life.	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-
CO2	Identify what is right and wrong through moral ethics.	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-
CO3	Analyze experimental learning while developing the society with ethos.	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-
CO4	Apply ethical principles to resolve the problems that arise in work place.	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-
CO5	Apply adequate knowledge on global code of conduct.	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-
Course Code	171HS3A10-EMPLOYABILITY SKILLS-I	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Explain the number and letter series and analogies in different models	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-
CO2	Demonstrate processes of coding & decoding and direction test	1	-	-	-	-	-	-	-	-	1	-	1	-	-	-
CO3	Demonstrate the basic grammatical skills using articles and prepositions	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-
CO4	Use tenses, voice types and conversion rules to deliver an effective speech	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-
CO5	Demonstrate creative speaking abilities using all forms of sentences	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-
<b>IV SEM</b>																
Course Code	171ES4T27 - KINEMATICS OF MACHINERY	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Explain types of kinematic links, pairs, and inversion	2	1	-	-	-	-	-	-	-	-	-	1	-	-	-
CO2	Explain different lower pair mechanisms for exact and approximate straight line motion.	1	1	-	-	-	-	-	-	-	-	-	1	-	-	-
CO3	Construct the velocity and acceleration diagrams using relative velocity and instantaneous venture method.	2	2	1	-	-	-	-	-	-	-	-	1	-	-	-
CO4	Construct displacement diagram and profile of cam with different types of follower motion.	2	2	2	-	-	-	-	-	-	-	-	1	-	-	-
CO5	Calculate the velocity ratio in power transmission.	1	2	2	-	-	-	-	-	-	-	-	1	-	-	-
Course Code	171MI4T04 - COMPUTER APPLICATIONS IN MINING	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Summarize fundamentals of programming through C.	2	1	-	-	-	-	-	-	-	-	-	-	-	2	-
CO2	Identify various database architectures and data models	3	2	2	2	1	-	-	-	-	-	-	-	-	2	-
CO3	Interpret relational database usingSQL.	2	1	-	-	-	-	-	-	-	-	-	-	-	2	-
CO4	Examine issues in data storage and query processing for appropriate solutions.	3	2	1	1	2	-	-	-	-	-	-	-	-	2	-
CO5	Depict ER-Diagrams for adatabase	3	2	1	1	2	-	-	-	-	-	-	-	-	2	-
Course Code	171MI4T05 - MINING GEOLOGY - II	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Identify the structural features of folds and unconformities in field.	3	2	-	-	-	-	-	-	-	-	-	-	3	-	-
CO2	Compare the mechanism of faulting and joints.	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-
CO3	Examine the sources of water in mines.	3	-	-	2	-	-	-	-	-	-	-	-	3	-	-

	CO Statements	POs												PSOs			
CO4	Apply the knowledge of economic geology.	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-
CO5	Estimate the ore reserves and its importance	-	3	-	2	-	-	-	-	-	-	-	-	-	3	-	-
Course Code	<b>171MI4T06 - MINE SURVEYING – I</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	
CO1	Analyze different types of surveying.	3	2	-	-	-	-	-	-	-	-	-	-	3	-	-	
CO2	Determine levels and Contours.	3	2	1	-	-	-	-	-	-	-	-	-	3	-	-	
CO3	Apply modern instruments of surveying.	3	2	-	-	-	-	-	-	-	-	-	-	3	-	-	
CO4	Evaluate the geodetic surveying GIS & GPS.	3	2	-	-	-	-	-	-	2	-	-	-	3	-	-	
CO5	Estimate volumes of borrow pits and areas of fields	3	2	-	-	-	-	1	-	1	-	-	-	3	-	-	
Course Code	<b>171MI4T07 - SURFACE MINING</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	
CO1	Analyze different surface mining methods.	3	2	-	-	-	-	-	-	-	-	-	-	3	-	-	
CO2	Design the layout and open of a large open cast mine.	3	2	1	-	-	-	-	-	-	-	-	-	3	-	-	
CO3	Design drilling and blasting for Surface mining.	3	2	1	-	-	-	-	-	-	-	-	-	3	-	-	
CO4	Choose the better excavation and loading method.	3	2	-	-	-	-	-	-	-	-	-	-	3	-	-	
CO5	Organize the transportation system.	3	2	-	-	-	-	-	-	-	-	-	-	3	-	-	
Course Code	<b>171MI4T08 - FUNDAMENTALS OF ROCK MECHANICS</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	
CO1	Estimate stress and strain in various mining applications.	3	2	-	-	-	-	-	-	-	-	-	-	3	-	-	
CO2	Evaluate the properties of rocks.	3	2	-	-	-	-	-	-	-	-	-	-	3	-	-	
CO3	Use various measuring devices to measure the load.	3	2	-	-	-	-	-	-	-	-	-	-	3	-	-	
CO4	Analyze the failure criteria in mines.	3	2	-	-	-	-	-	-	-	-	-	-	3	-	-	
CO5	Analyze stress concentration around mine openings	3	2	-	-	-	-	-	-	-	-	-	-	3	-	-	
Course Code	<b>171MI4L01 - GEOLOGY LAB</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	
CO1	Apply the knowledge of geology in the field of Mining engineering.	1	-	-	-	-	-	-	-	1	1	-	1	3	-	-	
CO2	Determine the megascopic identification of physical properties of various minerals and rocks.	1	-	-	3	-	-	-	-	1	1	-	1	3	-	-	
CO3	Interpret with Geological, topographical and satellite imagery.	1	-	-	-	3	-	-	-	1	1	-	1	3	-	-	
CO4	Identify various geological formations.	1	-	-	-	-	-	-	-	1	1	-	1	3	-	-	
CO5	Distinguish various landforms and rock formations in constructional areas.	1	-	2	-	-	-	-	-	1	1	-	1	3	-	-	
Course Code	<b>171MI4L02 - COMPUTER APPLICATION IN MINING LAB</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	
CO1	Apply the knowledge of computers in mine planning	1	-	-	-	3	-	-	-	1	1	-	1	-	3	-	
CO2	Assess the cut-off grade optimization & Stockpiling	-	-	1	1	-	-	-	-	1	1	-	1	-	3	-	
CO3	Design pit and dump	-	1	-	-	3	-	-	-	1	1	-	1	-	3	-	
CO4	Design mine planning and scheduling	-	1	-	-	3	-	-	-	1	1	-	1	-	3	-	
CO5	Design block modelling	-	1	-	-	3	-	-	-	1	1	-	1	-	3	-	
Course Code	<b>171HS4A08 - INTELLECTUAL PROPERTY RIGHTS AND PATENTS</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	
CO1	Compare various types of Intellectual Property rights.	-	-	-	-	-	-	-	3	-	-	-	2	-	-	-	

	CO Statements	POs												PSOs			
CO2	Discuss Intellectual Property and infer rights on such Intellectual Property owners	-	-	-	-	-	-	-	-	3	-	-	-	2	-	-	-
CO3	Explain the process of patenting	-	-	-	-	-	-	-	-	3	-	-	-	2	-	-	-
CO4	Apply for trade marks and trade secrets.	-	-	-	-	-	-	-	-	3	-	-	-	2	-	-	-
CO5	Interpret the legal issues on Intellectual Property Rights and cyber laws	-	-	-	-	-	-	-	-	3	-	-	-	2	-	-	-
Course Code	<b>171HS4A11 - EMPLOYABILITY SKILLS - II</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	
CO1	Examine the symbols, notations and venn diagrams	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-	
CO2	Use verbal adjectives, degree of comparisons in personality development	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-	
CO3	Solve problems of time & date and puzzles	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-	
CO4	Solve problems of cubes & dice and seating arrangements	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	
CO5	Use word analogy & paragraph writing for effective communication	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	
<b>V SEM</b>																	
Course Code	<b>171MI5T09 - UNDERGROUND COAL MINING TECHNOLOGY</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	
CO1	Illustrate the fundamentals of underground coal mining	3	-	-	-	-	-	-	-	-	-	-	-	-	3	-	
CO2	Explain the various mine development methods.	2	-	3	-	-	-	-	-	-	-	-	-	-	3	-	
CO3	Explain the long wall mining method	3	-	-	-	-	-	-	-	-	-	-	-	-	3	-	
CO4	Analyze the various thick and deep seam mining methods.	3	2	2	-	-	-	-	-	-	-	-	-	-	3	-	
CO5	Categorize the various modern mining methods.	2	-	-	3	-	-	-	-	-	-	-	-	-	3	-	
Course Code	<b>171MI5T10 - MINE ENVIRONMENTAL ENGINEERING-I</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	
CO1	Explain various gases-origins, occurrence, physiological effects.	3	2	-	-	-	-	-	-	-	-	-	-	3	-	-	
CO2	Identify mine climatic conditions by using various devices	3	2	-	-	-	-	-	-	-	-	-	-	3	-	-	
CO3	Analyze the necessity of mine ventilation systems.	3	2	-	-	-	-	-	-	-	-	-	-	3	-	-	
CO4	Analyze the operation of mine fans and related laws.	3	2	-	-	-	-	-	-	-	-	-	-	3	-	-	
CO5	Assess the ventilation planning, design and ventilation survey.	3	2	-	-	-	-	-	-	-	-	-	-	3	-	-	
Course Code	<b>171MI5T11 - BASIC GEO-MECHANICS</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	
CO1	Analyze different In-Situ stresses.	3	2	-	-	-	-	-	-	-	-	-	-	3	-	-	
CO2	Evaluate slope stability of an existing slope	3	2	-	-	-	-	-	-	-	-	-	-	3	-	-	
CO3	Design underground excavation and support	3	2	-	-	-	-	-	-	-	-	-	-	3	-	-	
CO4	Analyze mine subsidence and control measures.	3	2	-	-	-	-	-	-	-	-	-	-	3	-	-	
CO5	Apply numerical methods in rock mechanics to find rock mass properties.	3	2	-	-	-	-	-	-	-	-	-	-	3	-	-	
Course Code	<b>171MI5T12 - MINE SURVEYING-II</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	
CO1	Explain different correlation survey methods.	3	-	-	-	-	-	-	-	-	-	-	-	3	-	-	
CO2	Use suitable type of curve setting method in mines	3	-	-	-	-	-	-	-	-	-	-	-	3	-	-	

	CO Statements	POs												PSOs			
CO3	Solve the various problems on mine surveying.	3	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-
CO4	Choose the methods need to be adopted in deep seam mining.	3	1	2	-	-	-	-	-	-	-	-	-	-	3	-	-
CO5	Apply special modern surveying in mining industries.	3	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-
Course Code	<b>171HS5T04 - MANAGERIAL ECONOMICS &amp; FINANCIAL ANALYSIS</b>	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	
CO1	Explain the Managerial Economic concepts for decision making and forward planning.	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	
CO2	Illustrate the law of demand and its exceptions, to use different forecasting methods for predicting demand for various products and services.	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	
CO3	Identify the cost behavior, costs useful for managerial decision making and Break Even Point (BEP) of an enterprise.	1	1	-	-	-	-	-	-	-	-	1	-	-	-	-	
CO4	Outline the different types of business organizations along with basic knowledge on business cycle.	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	
CO5	Make use of the process & principles of accounting and prepare Journal, Ledger, Trial Balance, Trading A/c., Profit & Loss A/c. and Balance Sheet of an enterprise.	1	1	-	-	-	-	-	-	-	3	-	-	-	-	-	
CO6	Utilize various techniques on investment project proposals with the help of capital budgeting techniques for decision making.	1	1	-	-	-	-	-	-	-	-	2	-	-	-	-	
Course Code	<b>171MISE01 - MAINTENANCE AND RELIABILITY ENGINEERING (PROFESSIONAL ELECTIVE - I)</b>	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	
CO1	Illustrate the fundamentals of maintenance management and control.	1	-	-	-	-	-	-	-	-	-	2	-	-	3	-	
CO2	Categorize the various types of maintenance.	1	-	-	-	-	3	-	-	-	-	-	-	-	3	-	
CO3	Illustrate the fundamentals of reliability.	1	-	-	-	-	-	-	-	-	-	2	-	-	3	-	
CO4	Analyze the component reliability and hazard models.	1	-	-	3	-	-	2	-	-	-	-	-	-	3	-	
CO5	Explain the concept of reliability management	1	-	-	-	-	-	-	-	-	-	2	-	-	3	-	
Course Code	<b>171MISE02 - MINE CONSTRUCTION AND MANAGEMENT (PROFESSIONAL ELECTIVE - I)</b>	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	
CO1	Analyze the criteria of selection of sites for mine openings.	1	3	-	-	-	-	-	-	-	-	-	-	-	3	-	
CO2	Determine different types of linings.	1	3	-	-	-	-	-	-	-	-	-	-	-	3	-	
CO3	Explain the basic principles of first aid room and office	3	-	-	-	-	-	-	-	-	-	-	-	-	3	-	
CO4	Analyze the drivage through soft and hard rock, lateral and vertical pressures.	1	3	-	-	-	-	-	-	-	-	-	-	-	3	-	
CO5	Apply modern instruments of surface layouts pit top circuits and coal handling and coal preparation plant.	1	-	3	-	-	-	-	-	-	-	2	-	-	3	-	







	CO Statements	POs												PSOs		
Course Code	171HS6T07-EMPLOYABILITY SKILLS-IV	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Solve problems on Profit & Loss, Simple Interest & Compound Interest, Time & Work	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-
CO2	Solve problems on Pipes & Cisterns, Time & Distance, Boats & Streams	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-
CO3	Interpret the data collected for effective presentation	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-
CO4	Apply processes of Group discussion, Phonetics, Leadership skills in real world	-	-	-	-	-	-	-	-	-	2	-	1	-	-	-
CO5	Apply principles of Group Dynamics, Interview Skills & Evaluation criteria in organizations	-	-	-	-	-	-	-	-	-	2	-	1	-	-	-
Course Code	171MI6L05 - MINERAL PROCESSING TECHNOLOGY LAB	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Analyze the size distribution of a fixed granular solid by using a Test Sieve Stack and Vibratory Shaker.	2	1	1	-	-	-	-	-	1	1	-	1	-	3	-
CO2	Determine the size of crushed ore sample by using different types of crushers.	2	3	1	-	-	-	-	-	1	1	-	1	-	2	-
CO3	Analyze the effect of grinding by using Ball mill.	3	2	1	-	-	-	-	-	1	1	-	1	-	3	-
CO4	Perform the beneficiation of an ore pulp mix using Flootation Cell.	3	2	1	-	-	-	-	-	1	1	-	1	-	3	-
CO5	Analyze the mineral processing operations using magnetic separator and jigging.	2	3	1	-	-	-	-	-	1	1	-	1	-	2	-
Course Code	171MI6L06 - ENVIRONMENTAL ENGINEERING LAB	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Determine the composition of various gases by using corresponding detectors.	1	-	3	-	-	-	-	-	1	1	-	1	-	-	3
CO2	Analyze gases by using Gas Chromatograph and Infrared gas analyzer.	1	-	3	-	-	-	-	-	1	1	-	1	-	-	3
CO3	Determine Relative humidity & cooling power of mine air	1	3	-	2	-	-	-	-	1	1	-	1	-	-	3
CO4	Use different types of rescue apparatus in hazardous conditions.	2	-	-	-	-	-	-	-	1	1	-	1	-	-	3
CO5	Determine calorific value of coal using Bomb Calorimeter..	3	-	-	-	-	-	-	-	1	1	-	1	-	-	3
VII SEM																
Course Code	171MI7T17 - MINE ECONOMICS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Describe importance of strategic minerals.	2	3	-	-	-	-	-	-	-	2	-	-	3	-	-
CO2	Classify grading and pricing of minerals.	2	3	-	-	-	-	-	-	-	-	-	-	3	-	-
CO3	Estimate total reserve of minerals using sampling methods..	2	3	1	-	-	-	-	-	-	-	-	-	3	-	-
CO4	Compare investment alternatives using by NPV and IRR methods.	2	3	-	-	1	-	-	-	-	-	-	-	3	-	-
CO5	Explain wage systems and cost accounting in organizations.	2	3	2	-	-	-	-	-	-	-	-	-	3	-	-

CO Statements		POs												PSOs		
Course Code	171MI7T18 - MINE HEALTH AND SAFETY ENGINEERING	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Explain the different health hazards and its prevention in mining industries.	2	3	-	-	-	-	-	-	-	-	-	-	-	-	3
CO2	Distinguish the mine accidents occurring in surface and underground mining area.	2	3	-	-	-	-	-	-	-	-	-	-	-	-	3
CO3	Illustrate the various approaches towards safety risk assessment.	2	-	-	1	-	-	-	-	-	-	-	-	-	-	3
CO4	Discuss the safety planning and safety management systems	2	-	2	-	-	-	-	-	-	-	-	-	-	-	3
CO5	Analyze the innovations in mine safety engineering.	2	3	-	-	-	-	-	-	-	-	-	-	-	-	3
Course Code	171MI7T19 - MINE LEGISLATION AND GENERAL SAFETY	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Illustrate the general principle of mining laws and regulations	1	3	-	-	-	-	2	-	-	-	-	-	3	-	-
CO2	Compare the rules and regulation framed under CMR& MMR.	1	3	-	-	-	-	-	-	-	-	-	-	3	-	-
CO3	Explain the various mining rules and Indian electricity rules	-	-	2	-	-	-	-	-	-	-	-	-	3	-	-
CO4	Explain the Mineral concession rules and mine act	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-
CO5	Explain the training rules and DGMS circular	-	-	3	-	-	-	-	-	-	-	-	-	3	-	-
Course Code	171MI7T20 - MINE MANAGEMENT	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Explain the evolution of management theories.	3	2	2	-	-	-	-	-	-	-	-	-	3	-	-
CO2	Explain the functions of management.	3	-	-	-	-	-	-	-	-	-	2	-	3	-	-
CO3	Explain the organization structures of mining industry.	-	3	-	-	-	-	-	-	-	-	2	-	3	-	-
CO4	Explain the role workers in trade unionism.	-	3	-	-	-	-	-	-	-	-	2	-	3	-	-
CO5	Explain the challenges of environmental management in mines.	-	3	2	-	-	-	-	-	-	-	-	-	3	-	-
Course Code	171MI7E10 - PLANNING OF UNDERGROUND METAL MINING PROJECT (PROFESSIONAL ELECTIVE - IV)	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Estimate of production rate, stope sizing & global sequencing in metal mines.	-	3	2	-	-	-	-	-	-	-	1	-	3	-	-
CO2	Plan and scheduling of activities in metal mining and processing of underground metal mines.	-	-	3	-	-	-	-	-	-	-	1	-	3	-	-
CO3	Analyze underground metal mining equipment selection & support	-	3	-	-	-	-	-	-	-	-	-	-	3	-	-
CO4	Estimate the grade control of ore in metal mines.	3	-	-	-	-	-	-	-	-	-	-	-	3	-	-
CO5	Design surface layouts including mill and concentrator plants.	-	3	2	-	-	-	-	-	-	-	-	-	3	-	-
Course Code	171MI7E11 - PLANNING OF UNDERGROUND COAL MINING PROJECT (PROFESSIONAL ELECTIVE - IV)	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Analyze different stages in the life of a mine.	-	3	-	-	-	-	-	-	-	-	-	-	3	-	-
CO2	Distinguish the method of mining on the basis of planning of exploitation.	-	3	-	-	-	-	-	-	-	-	-	-	3	-	-
CO3	Illustrate the planning and automation of deep underground coal mines.	2	3	-	-	-	-	-	-	-	-	-	-	3	-	-

	CO Statements	POs												PSOs		
CO4	Discuss the planning and designing layouts of ventilation.	-	3	-	-	-	-	-	-	-	-	-	-	3	-	-
CO5	Explain coal gasification.	-	3	2	-	2	-	-	-	-	-	-	-	3	-	-
<b>Course Code</b>	<b>171MI7E12 - PLANNING OF SURFACE MINING PROJECT (PROFESSIONAL ELECTIVE - IV)</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>
CO1	Prepare feasibility report of mining project.	1	3	-	-	-	-	-	-	-	-	-	-	3	-	-
CO2	Design open pit slope angels & ultimate pit limit	1	-	3	-	-	-	-	-	-	-	-	-	3	-	-
CO3	Select transport and dumping systems in open pit mines.	1	-	3	-	-	-	-	-	-	-	-	-	3	-	-
CO4	Examine stability analysis in surface mines.	1	3	-	2	-	-	-	-	-	-	-	-	3	-	-
CO5	Explain transition of underground to opencast mines.	1	-	3	-	-	-	-	-	-	-	-	-	3	-	-
<b>Course Code</b>	<b>171MI7E13 - MINE MECHANIZATION (PROFESSIONAL ELECTIVE - V)</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>
CO1	Assess the mine mechanization system.	-	-	-	-	-	-	-	-	3	-	2	-	3	-	-
CO2	Choose surface & underground transport medium for ore and waste.	-	-	-	1	3	-	-	-	-	-	-	-	3	-	-
CO3	Predict optimist conveyor system in mines.	-	-	-	-	-	3	-	-	-	-	2	-	3	-	-
CO4	Design winding system	-	-	3	-	-	2	-	-	-	-	-	-	3	-	-
CO5	Select equipment in surface and underground mines.	-	-	-	-	2	-	-	-	-	-	-	-	3	-	-
<b>Course Code</b>	<b>171MI7E14 - ADVANCE UNDERGROUND COAL MINING TECHNOLOGY (PROFESSIONAL ELECTIVE - V)</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>
CO1	Explain the extraction of thick seam mining methods.	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-
CO2	Identify and solve the problems and issues on multiple seam mine workings.	-	3	-	-	-	-	-	-	-	-	-	-	-	3	-
CO3	Choose the advanced techniques for design of underground workings.	-	-	-	3	-	-	-	-	-	-	-	-	-	3	-
CO4	Evaluate the methods need to be adopted in extraction of locked up pillars.	3	2	-	-	-	-	-	-	-	-	-	-	-	3	-
CO5	Design supports for underground mines.	-	-	3	-	-	-	-	-	-	-	-	-	-	3	-
<b>Course Code</b>	<b>171MI7E15 - MINE BLASTING OPERATION (PROFESSIONAL ELECTIVE - V)</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>
CO1	Differentiate between explosives and initiating systems.	-	3	-	-	-	-	-	-	-	-	-	-	-	3	-
CO2	Use blasting accessories to design blasting operations.	3	-	-	-	-	-	-	-	-	-	-	-	-	3	-
CO3	Analyse problems associated with open cast blasting and mitigation.	-	3	-	-	-	-	-	-	-	-	-	-	-	2	-
CO4	Analyse problems associated with underground blasting and mitigation.	-	3	-	-	-	-	-	-	-	-	-	-	-	3	-
CO5	Assess blasting in metal mines.	3	2	-	-	-	-	-	-	-	-	-	-	-	3	-
<b>Course Code</b>	<b>171MI7L07 - MINE PLANNING AND DESIGN LAB</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>
CO1	Determine stripping ratio and pit limits.	3	2	2	-	-	-	-	-	1	1	-	1	3	-	-
CO2	Design blasting in open cost and underground mines.	3	-	2	-	-	-	-	-	1	1	-	1	3	-	-





	CO Statements	POs												PSOs		
Course Code	171MI8003 - FUNDAMENTALS OF COMMUNICATION (OPEN ELECTIVE)	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Demonstrate types of signals and relation of time domain representation to frequency domain.	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	Apply signal concepts to continuous wave modulation.	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-
CO3	Interpret the basic concepts of pulse modulation.	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-
CO4	Analyze the concepts of digital modulation techniques.	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-
CO5	Summarize different advanced communication networks.	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-
Course Code	171MI8004 - REMOTE SENSING AND GIS (OPEN ELECTIVE)	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Analyze the elements of photogrammetry.	1	-	-	-	-	-	1	-	-	-	-	-	-	1	-
CO2	Determine multi concept remote sensing and false color composite.	1	1	-	-	-	-	1	-	-	-	-	-	-	1	-
CO3	Analyze the edge detection and filtering.	2	1	-	-	-	-	1	-	-	-	-	-	-	1	-
CO4	Explain the principal components and image classification.	1	-	-	-	-	-	1	-	-	-	-	-	-	1	-
CO5	Apply the remote sensing ion various fields.	1	1	-	-	-	-	1	-	-	-	-	-	-	1	-
Course Code	171MI8005 - QUANTITATIVE DECISION MAKING (OPEN ELECTIVE)	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Describe a set of data using histograms, scatter diagrams and summary statistics.	1	-	-	-	-	-	-	-	-	-	1	-	-	-	-
CO2	Develop statistics from sample data to support confidence interval estimation.	1	-	-	-	-	-	-	-	-	-	1	-	-	-	-
CO3	Construct effective models of decision making.	1	-	-	-	-	-	-	-	-	-	1	-	-	-	-
CO4	Estimate optimal solutions to decision making models.	1	-	-	-	-	-	-	-	-	-	1	-	-	-	-
CO5	Analyze spreadsheet simulation models.	1	-	-	-	-	-	-	-	-	-	1	-	-	-	-
Course Code	171MI8P02 - MAJOR PROJECT	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Develop technical procedure of planning and scheduling of an identified project work through technical survey in line with societal and environmental implications.	1	-	-	-	-	2	2	-	-	-	1	-	3	-	-
CO2	Demonstrate technical skills of data collection and data analysis adhering to professional ethics	1	-	-	-	-	-	-	2	-	-	1	1	3	-	-
CO3	Design the solutions for the critical problem areas marked in data analysis	2	2	3	2	-	-	-	-	-	-	-	-	3	-	-
CO4	Build a team of people to work together and communicate well in the critical stages of project progress.	-	-	-	-	-	-	-	-	1	2	1	1	3	-	-
CO5	Use modern tools to derive conclusions and communicating the results of the project work effectively	-	-	-	-	3	-	-	-	-	2	1	1	3	-	-