ADITYA ENGINEERING COLLEGE

An Autonomous Institutuion

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Recognised by UGC under sections 2(f) and 12(B) of UGC Act, 1956
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Department of Petroleum Technology

B.Tech - AR 20 - Course Articulation Matrix

Note: Correlation Levels are 1 or 2 or 3. Where 1- Slight(Low), 2 - Moderate(Medium), 3 - Substantial (High).

	CO Statements	POs												PSOs	
I SEM															
Course Code	**201HS1T01 - Communicative English**	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	Identify the ways to overcome fear and use of words paradoxically,	-	-	-	-	-	-	1	-	-	3	-	-	-	-
CO2	interpret the developing conditions and the core competences of the state to prioritize education system.	-	-	-	-	-	-	1	-	-	3	-	-	-	-
CO3	Explain about world's most precious natural resources.	-	-	-	-	-	-	-	-	-	3	-	-	-	-
CO4	Explain about importance of unity to abolish war.	-	-	-	-	-	-	-	-	2	3	-	2	-	-
CO5	Respond well to the changing situations in life with independent knowledge for better decision making.	-	-	-	-	-	-	-	-	1	3	-	-	-	-
Course Code	**201BS1T01 - Differential Equations and Linear Algebra**	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	Apply the concepts of Mean Value theorem, Partial Differentiation and identify the maxima and minima of a given function.	3	2	-	-	-	-	-	-	-	-	-	-	-	-
CO2	Solve the linear differential equations and model various situations involving differential equations of first order.	3	2	-	-	-	-	-	-	-	-	-	-	-	-
CO3	Solve linear differential equations of higher order and model various situations involving second order differential equations.	3	2	-	-	-	-	-	-	-	-	-	-	-	-

	CO Statements	POs												PSOs	
CO4	Calculate Rank of a matrix and solve the system of Linear equations and find the Eigen values and Eigen vectors.	3	2	-	-	-	-	-	-	-	-	-	-	-	-
CO5	Compute various powers of a matrix and identify the nature of the quadratic form.	3	2	-	-	-	-	-	-	-	-	-	-	-	-
Course Code	201BS1T02 - Engineering Physics	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	Explain the basic concepts of crystal structure and X ray diffractionTechniques.	2	1	-	-	-	-	-	-	-	-	-	-	-	-
CO2	Apply the knowledge of acoustics to improve acoustic quality of concerthalls and understand the concepts of flaw detection techniques using ultrasonics.	3	2	-	-	-	-	-	-	-	-	-	-	-	-
CO3	Apply the structure property relationship exhibited by solid materials within the elastic limit.	3	2	-	-	-	-	-	-	-	-	-	-	-	-
CO4	Explain the basic concepts of LASERs along with its Engineering applications and familiarize with types of sensors for various engineering applications	2	1	-	-	-	-	-	-	-	-	-	-	-	-
CO5	Explain about magnetic and dielectric properties of different materials.	3	2	-	-	-	-	-	-	-	-	-	-	-	-
Course Code	201ES1T03 - Essential Electrical and Electronics Engineering	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	Construct simple electrical circuits using basic laws.	3	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	Explain the constructional features of DC Machines and working	2	1	-	-	-	-	-	-	-	-	-	-	-	-
CO3	Examine the performance of single-phase transformer.	3	3	2	-	-	-	-	-	-	-	-	-	-	-
CO4	Illustrate the principle of AC rotating machines.	3	-	-	-	-	-	-	-	-	-	-	-	-	-
CO5	Analyze the device structure, operation and application of Diode and Transistor.	3	3	2	-	-	-	-	-	-	-	-	-	-	-

	CO Statements	POs												PSOs	
Course Code	**201ES1T05 - Engineering Graphics**	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	Sketch the polygons, conics and scales by using the principles of drawing	3	2	1	-	-	-	-	-	-	-	-	-	-	-
CO2	Draw Orthographic projections of points and lines..	3	2	1	-	-	-	-	-	-	-	-	-	-	-
CO3	Draw Orthographic projections of planes in various positions	3	2	1	-	-	-	-	-	-	-	-	-	-	-
CO4	Draw Orthographic projections of solids in various positions.	3	2	1	-	-	-	-	-	-	-	-	-	-	-
CO5	Construct isometric scale and isometric projections	3	2	1	-	-	-	-	-	-	-	-	-	-	-
Course Code	**201HS1L01 - Communicative English Lab**	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	Make use of the concepts to communicate confidently and competently in English Language in all spheres.	-	-	-	-	1	-	-	-	-	3	-	1	-	-
CO2	Express Creative skills to construct Dialogues / Conversations in Spoken and Written forms.	-	-	-	-	1	-	-	-	-	3	-	2	-	-
CO3	Identify Accent for intelligibility.	-	-	-	-	1	-	-	-	-	3	-	2	-	-
CO4	Demonstrate communicative ability in everyday Conversation, JAM Sessions and Public Speaking.	-	-	-	-	1	-	-	-	-	3	-	1	-	-
CO5	Demonstrate nuances of Language through Audio – Visual Experience and group activities.	-	-	-	-	1	-	-	-	-	3	-	1	-	-
Course Code	**201BS1L01 - Engineering Physics Lab**	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	Determine the rigidity and young's modulus to understand material properties.	3	2	-	-	-	-	-	-	3	-	-	1	-	-
CO2	Determine Acceleration due to Gravity and Radius of Gyration and spring constant by oscillatory mechanics	2	2	-	-	-	-	-	-	3	-	-	1	-	-
CO3	Find the strength of the magnetic field.	3	1	-	-	-	-	-	-	3	-	-	1	-	-

	CO Statements	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
							POs							PSOs	
CO4	Determine wavelength of unknown source, particle size using lasers.	3	2	-	-	-	-	-	-	3	-	-	1	-	-
CO5	Determination of velocity of sound, moment of inertia	3	2	-	-	-	-	-	-	3	-	-	1	-	-
Course Code	201ES1L03 - Essential Electrical and Electronics Engineering Lab	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	Analyze the electrical networks using network theorems	3	2	1	1	-	-	-	-	-	-	-	-	3	-
CO2	Analyze the performance of AC and DC Machines.	3	3	2	-	-	-	-	-	-	-	-	-	3	-
CO3	Estimate the performance of 1-phase transformer.	3	2	1	1	-	-	-	-	-	-	-	-	3	-
CO4	Explain diode characteristics and its applications	2	1	-	-	-	-	-	-	-	-	-	-	-	-
CO5	Explain the simulation of diode and transistor.	2	1	-	-	-	-	-	-	-	-	-	-	-	-
Course Code	201MC1T01 - Environmental Science	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	Identify the need for protecting the producers and consumers in various ecosystems and their role in the food web.	-	-	-	-	-	-	2	-	-	-	-	-	-	-
CO2	Outline the natural resources and their importance for the sustenance of the life.	-	-	-	-	-	-	3	-	-	-	-	-	-	-
CO3	List out the biodiversity of India, threats and its conservation methods	-	-	-	-	-	-	2	-	-	-	-	-	-	-
CO4	Illustrate various attributes of the pollution, impacts and measures to control the pollution along with waste management practices.	-	-	-	-	-	-	3	-	-	-	-	-	-	-
CO5	Describe social issues both rural and urban environment to combat the challenges.	-	-	-	-	-	-	3	-	-	-	-	-	-	-
CO6	Summarize the legislations of India in environmental protection.	-	-	-	-	-	-	3	-	-	-	-	-	-	-

	CO Statements	POs												PSOs	
II SEM															
Course Code	**201BS2T05 - Partial Differential Equations and Vector Calculus**	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	Solve improper integrals using beta and gamma functions.	3	2	-	-	-	-	-	-	-	-	-	-	-	-
CO2	Solve partial differential equations of first order.	3	2	-	-	-	-	-	-	-	-	-	-	-	-
CO3	Compute the double integral over a region and triple integral over a volume.	3	2	-	-	-	-	-	-	-	-	-	-	-	-
CO4	Calculate the gradient of a scalar function, divergence and curl of a vector function.	3	2	-	-	-	-	-	-	-	-	-	-	-	-
CO5	Apply line, surface and volume integrals.	3	2	-	-	-	-	-	-	-	-	-	-	-	-
Course Code	**201BS2T08 - Chemistry of Materials**	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	Compare the quality of drinking water and problems associated with hardwater.	3	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	Explain the fundamentals and applications of Electrochemical energy systems.	2	-	-	-	-	-	-	-	-	-	-	-	-	-
CO3	Explain fundamentals and applications of polymers and building materials.	3	-	-	-	-	-	-	-	-	-	-	-	-	-
CO4	Explain the fundamentals and controlling methods of corrosion.	2	-	-	-	-	-	-	-	-	-	-	-	-	-
CO5	Explain the properties and applications of nano materials, conductors, Semiconductors and Super conductors.	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Course Code	**201ES2T06 - Engineering Mechanics**	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	Determine the resultant force and moment for a given force system	3	1	1	-	-	-	-	-	-	-	-	-	-	-
CO2	Solve the member forces in trusses.	3	2	1	-	-	-	-	-	-	-	-	-	-	-

	CO Statements				POs									PSOs	
CO3	Apply concept of Virtual work to find the work done by force and couple.	3	2	1	-	-	-	-	-	-	-	-	-	-	-	-
CO4	Solve the centre of gravity and moment of inertia for various geometric shapes	2	2	1	-	-	-	-	-	-	-	-	-	-	-	-
CO5	Determine the displacement, velocity and acceleration relations in dynamic systems.	2	2	1	-	-	-	-	-	-	-	-	-	-	-	-
Course Code	201ES2T08 - Programming for Problem Solving Using C	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	Illustrate the fundamental concepts of computers and basics of computer programming.	2	1	-	-	1	-	-	-	-	-	-	3	-	-
CO2	Makeuse of control structures and arrays in solving complex problems	3	2	1	1	3	-	-	-	-	-	-	3	-	-
CO3	Develop program on modular and strings fundamentals.	3	2	1	1	3	-	-	-	-	-	-	3	-	-
CO4	Demonstrate the ideas of pointer susage.	2	1	-	-	2	-	-	-	-	-	-	3	-	-
CO5	Solve real world problems using the concept of structures,unions and File operations.	3	2	1	1	3	-	-	-	-	-	-	3	-	-
Course Code	201ES2L07 - Engineering Workshop	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	Prepare cross lap and dovetail joints using Carpentry tools	1	-	-	-	-	-	-	-	1	-	-	1	-	-
CO2	Prepare V-Fit and Square Fit using Fitting tools	1	-	-	-	-	-	-	-	1	-	-	1	-	-
CO3	Develop Tray and Funnel surfaces using Tin smithy tools	1	-	-	-	-	-	-	-	1	-	-	1	-	-
CO4	Convert Round rod to Square and S-hook using Black smithy tools	1	-	-	-	-	-	-	-	1	-	-	1	-	-
CO5	Check the circuit for Parallel and Series connection of bulbs using House wiring tools	1	-	-	-	-	-	-	-	1	-	-	1	-	-

	CO Statements	POs												PSOs	
Course Code	201ES2L12 - Computer Aided Drafting Lab	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	Explain the basic functions of drawing software.	3	-	1	-	-	-	-	-	-	3	-	-	-	-
CO2	Select the Construction and editing commands for specified drawings.	3	-	1	-	-	-	-	-	-	3	-	-	-	-
CO3	Apply the concepts of Blocks, Hatching and Layers.	3	-	1	-	-	-	-	-	-	3	-	-	-	-
CO4	Draw the isometric views & orthographic views with dimensions	3	-	1	-	-	-	-	-	-	3	-	3	-	-
CO5	Draw the 3D Model for mechanical components	3	-	1	-	-	-	-	-	-	3	-	3	-	-
Course Code	201HS2L02 - Professional Communications Skills Lab	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
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	201BS2L05 - Engineering Chemistry Lab	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	Demonstrate Complexometric titrations by volumetric analysis.	2	-	-	-	-	-	-	-	1	-	-	1	-	-
CO2	Demonstrate Acid – Base titrations by instrumental analysis.	2	-	-	-	-	-	-	-	1	-	-	1	-	-
CO3	Estimate Vitamin C using volumetric analysis	2	-	-	-	-	-	-	-	1	-	-	1	-	-

	CO Statements	POs												PSOs	
CO4	Prepare polymer like Bakelite.	2	-	-	-	-	-	-	-	1	-	-	1	-	-
CO5	Prepare alternative fuel like Bio-Diesel.	2	-	-	-	-	-	-	-	1	-	-	1	-	-
Course Code	201ES2L10 - Programming for Problem Solving Using C Lab	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	Develop the basic programs in C and draw the flowcharts using Raptor.	2	1	-	-	1	-	-	-	-	-	-	3	-	-
CO2	Make use of conditional and iterative statements to solve real time scenarios in C.	3	2	1	1	3	-	-	-	-	-	-	3	-	-
CO3	Apply the concept of arrays, modularity and strings to handle complex problems.	3	2	1	1	3	-	-	-	-	-	-	3	-	-
CO4	Apply the dynamic memory allocation functions using pointers.	3	2	-	-	3	-	-	-	-	-	-	3	-	-
CO5	Develop programs using structures, and Files.	3	2	1	1	3	-	-	-	-	-	-	3	-	-
Course Code	201MC2T02 - Constitution of India	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	Explain historical background ofthe constitution making and its importance for building a democratic India.	-	-	-	-	-	-	-	-	2	-	-	-	-	-
CO2	Compare the functioning of three wings of the government i.e. executive, legislative and judiciary.	-	-	-	-	-	-	-	-	3	-	-	-	-	-
CO3	Interpret the value of the fundamental rights and duties for becoming good citizen of India.	-	-	-	-	-	-	-	-	3	-	-	-	-	-
CO4	Compare the decentralization of power between central, state and local self-government.	-	-	-	-	-	-	-	-	3	-	-	-	-	-
CO5	Extend the knowledge in strengthening of the constitutional institutions like CAG, Election Commission and UPSC for sustaining democracy.	-	-	-	-	-	-	-	-	2	-	-	-	-	-

	CO Statements	POs												PSOs	
III SEM															
Course Code	**201BS3T14 - Numerical Methods and Integral Transforms**	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	Apply numerical methods to solve equations and interpolation of polynomials.	3	2	-	-	-	-	-	-	-	-	-	-	-	-
CO2	Apply numerical methods to solve initial value problems and problems involving integration.	3	2	-	-	-	-	-	-	-	-	-	-	-	-
CO3	Compute Fourier series of a function	3	2	-	-	-	-	-	-	-	-	-	-	-	-
CO4	Compute the Fourier transform of a function.	3	2	-	-	-	-	-	-	-	-	-	-	-	-
CO5	Apply Laplace transform to solve initial value problems.	3	2	-	-	-	-	-	-	-	-	-	-	-	-
Course Code	**201PT3T01 - Principles of Geology for Petroleum Engineers**	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	Explain the general facts of the earth.	2	-	-	-	-	-	-	-	-	-	-	-	2	-
CO2	Analyze the different processes for the formation of landforms.	2	-	-	-	-	-	-	-	-	-	-	-	2	-
CO3	Analyze the different erosion cycles and their products.	2	-	-	-	-	-	-	-	-	-	-	-	2	-
CO4	Compare and classify various kinds of rocks.	3	-	-	-	-	-	-	-	-	-	-	-	2	-
CO5	Explain how basins and deltas are formed	2	-	-	-	-	-	-	-	-	-	-	-	2	-
CO6	Explain the uses of micro fossils in oil exploration.	2	-	-	-	-	-	-	-	-	-	-	-	2	-
Course Code	**201PT3T02 - Material and Energy Balance**	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	Solve basic calculations of stoichiometric and ideal gaseous mixtures.	3	2	-	-	-	-	-	-	-	-	-	-	3	-

	CO Statements	POs												PSOs	
CO2	Apply vapor pressure, humidity and saturation for engineering calculations.	2	2	-	-	-	-	-	-	-	-	-	-	2	-
CO3	Calculate the material balances with and without chemical reactions.	3	2	-	-	-	-	-	-	-	-	-	-	2	-
CO4	Calculate the energy balances with reactive and non-reactive process systems.	3	2	-	-	-	-	-	-	-	-	-	-	2	-
CO5	Solve combustion calculations and thermal efficiency calculations.	2	2	-	-	-	-	-	-	-	-	-	-	3	-
Course Code	201PT3T03 - Petroleum Exploration	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	Apply the different geological approaches for exploration of oil and gas deposits.	3	-	-	-	-	-	-	-	-	-	-	2	2	-
CO2	Utilize the principles of gravity prospecting to explore the subsurface rocks favorable for hydrocarbon deposits.	3	-	-	-	-	-	-	-	-	-	-	2	2	-
CO3	Make use of principles of magnetic method to explore sedimentary basins.	3	-	-	-	-	-	-	-	-	-	-	2	2	-
CO4	Apply the method of seismic refraction to estimate the velocity and thickness of different subsurface geological layers.	3	-	-	-	-	-	-	-	-	-	-	2	2	-
CO5	Apply different seismic reflection techniques in selected areas of structural interest revealed by the gravity and magnetic methods to locate oil bearing structures.	3	-	-	-	-	-	-	-	-	-	-	2	2	-
Course Code	201PT3T04 - Fluid Mechanics for Petroleum Engineers	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	Explain the basic concepts of dimensional analysis and fluid flow phenomena.	2	3	-	2	-	-	-	-	-	-	-	-	-	1
CO2	Solve mass balance in a flowing fluid, continuity, differential momentum balance and mechanical energy equations.	2	3	-	2	-	-	-	-	-	-	-	-	-	3
CO3	Classify compressible and incompressible fluids flow in pipes and channels.	2	3	-	2	-	-	-	-	-	-	-	-	-	1
CO4	Calculate the drag and drag coefficient, flow through beds of solids, motion of particles through fluids.	2	3	-	2	-	-	-	-	-	-	-	-	-	1
CO5	Explain about transportation, metering of fluids and measurement of flowing fluids.	2	3	-	2	-	-	-	-	-	-	-	-	-	2

	CO Statements	POs												PSOs	
Course Code	**201PT3L01 - Principles of Geology for Petroleum Engineers lab**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Make use of maps to estimate reservour area, thickness, and draw litho stratigrathy coloums.	3	-	-	-	-	-	-	-	2	2	-	1	-	1
CO2	Construct Geological map, strike, dip at any chosen location/ different geological locations and do sampling for paleontological studies at any locaton.	3	-	-	-	-	-	-	-	2	2	-	1	-	1
CO3	Estimate the levels of existing ground with the help of auto level.	3	-	-	-	-	-	-	-	2	2	-	1	-	1
CO4	Find out the oil-water contact.	3	-	-	-	-	-	-	-	2	2	-	1	-	1
CO5	Identify different types of rocks	3	-	-	-	-	-	-	-	2	2	-	1	-	1
Course Code	**201PT3L02 - Fluid Mechanics for Petroleum Engineers Lab**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Identify laminar and turbulent flows in major equipment like Reynolds apparatus and operate fluid flow equipment and instrumentation.	-	-	-	-	-	-	-	-	3	2	-	2	-	2
CO2	Calculate momentum transfer principles and experimentation methods.	-	-	-	-	-	-	-	-	3	2	-	2	-	2
CO3	Classify involving Bernoulli's equation for the transport of acidic, alkaline, hydrocarbon and miscellaneous incompressible fluids in pipelines.	-	-	-	-	-	-	-	-	3	2	-	2	-	2
CO4	Solve pressure drop calculations and energy requirements associated to compressible fluid flow in circular and rectangular ducts.	-	-	-	-	-	-	-	-	3	2	-	2	-	2
CO5	Apply pressure drop in packed and fluidized beds and prepare reports following accepted writing and graphical techniques.	-	-	-	-	-	-	-	-	3	2	-	2	-	2
Course Code	**201PT3L03 - Mathematical Methods Lab**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Calculate molar volume and Compressibility from Redlich-Kwong Equation.	-	-	-	-	3	-	-	-	-	-	-	2	3	-

	CO Statements	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
						POs								**PSOs**	
CO2	Calculate flow rate in a pipeline.	-	-	-	-	3	-	-	-	-	-	-	2	2	-
CO3	Solve compressibility factor variation from Vanderwaals Equation.	-	-	-	-	3	-	-	-	-	-	-	2	2	-
CO4	Solve Stiff Ordinary Differential Equations.	-	-	-	-	3	-	-	-	-	-	-	2	2	-
CO5	Apply shooting method for solving two-point boundary value problems.	-	-	-	-	3	-	-	-	-	-	-	2	3	-
Course Code	**201SC3L10 - Skill oriented course -I Industry Exploration Project**	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	Get exposed to various professional activities in a petroleum industry.	1	1	-	-	-	-	-	-	-	1	-	1	-	-
CO2	Judge the importance and relevance of various subjects in curriculum.	1	2	-	-	-	-	-	-	-	-	1	1	-	-
CO3	Know the possible career options in a petroleum industry.	1	-	-	-	-	-	-	2	-	-	1	1	-	-
CO4	Assess the scale of operations.	2	2	-	2	-	-	-	-	-	-	-	-	-	-
CO5	Acquaint with different forms of technical communication.	-	-	-	-	-	-	-	-	1	2	1	1	-	-
Course Code	**201MC3T03 - Biology For Engineers**	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	Apply biological engineering principles,procedures needed to solve real-world problems.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	Demonstrate the fundamentals of living things,their classification,cell structure and bio chemical constituents.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO3	Apply the concept of plant,animal and microbial systems and growth in real life Situations.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO4	Explain genetics and the immune system to know the cause,symptoms, diagnosis and treatment of common diseases.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO5	Demonstrate basic knowledge of the applications of biological systems in relevant industries.	-	-	-	-	-	-	-	-	-	-	-	-	-	-

	CO Statements	POs												PSOs	
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
IV SEM																
Course Code	**201ES4T20 - Mechanical and Materials Science and Engineering**	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	Calculate the design parameters stress,strain,elastic constants and strain energy of different materials under different loading conditions.	2	1	3	-	-	-	3	-	-	-	-	-	-	-
CO2	Calculate Shear force and bending moment for beams under various loading conditions and interpret as Shear force diagram & Bending moment diagram	3	3	2	-	-	-	1	-	-	-	-	-	-	-
CO3	Compare the behavior of materials by means of phase diagrams.	2	1	-	-	-	-	3	2	-	2	-	-	-	-
CO4	Explain the mechanical behavior of materials by dislocation theory	2	1	-	-	-	-	3	2	-	-	-	-	-	-
CO5	Select the suitable material for petroleum engineering applications.	3	2	1	1	-	-	3	3	-	2	-	-	-	-
Course Code	**201BS4T17 - Complex Variables and Statistical Methods**	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	Apply Cauchy-Riemann equations to complex functions in order to determine whether a given continuous function is analytic and find the differentiation and integration of complex functions used in engineering problems.	3	2	-	-	-	-	-	-	-	-	-	-	1	-
CO2	Make use of the Cauchy residue theorem to evaluate certain integrals.	3	2	-	-	-	-	-	-	-	-	-	-	-	1
CO3	Apply discrete and continuous probability distributions	3	2	-	-	-	-	-	-	-	-	-	-	-	-
CO4	Design the components of a classical hypothesis test	3	2	-	-	-	-	-	-	-	-	-	-	2	-
CO5	Infer the statistical inferential methods based on small and large sampling tests	3	2	-	-	-	-	-	-	-	-	-	-	-	-

	CO Statements	POs												PSOs	
Course Code	**201PT4T05 - Petroleum Geology**	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	Outline different source rocks and choose better one for oil formation.	2	-	-	-	-	-	-	-	-	-	-	3	2	-
CO2	Analyze the different factors for the mechanism of oil migration.	3	-	-	-	-	-	-	-	-	-	-	3	2	-
CO3	Apply the petrophysical properties of reservoir and cap rocks for oil retention.	3	-	-	-	-	-	-	-	-	-	-	3	2	-
CO4	Build a geological model for ideal petroleum system	2	-	-	-	-	-	-	-	-	-	-	3	2	-
CO5	Explain the different types of sedimentary basins.	3	-	-	-	-	-	-	-	-	-	-	3	2	-
Course Code	**201PT4T06 - Heat Transfer Operations**	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	Explain the various modes of heat transfer and the principles involved in them and its application in process industries.	3	2	-	-	-	-	-	-	-	-	-	2	-	2
CO2	Make use of individual heat transfer coefficients to determine over all heat transfer rate	3	2	-	-	-	-	-	-	-	-	-	2	-	2
CO3	Explain the concepts of heat transfer without phase change	3	2	-	-	-	-	-	-	-	-	-	2	-	2
CO4	Explain the concepts of heat transfer with phase change and demonstrate the radiation heat transfer	1	2	-	-	-	-	-	-	-	-	-	2	-	2
CO5	Identify the types of heat exchanger equipment and know their intended purpose	3	2	-	-	-	-	-	-	-	-	-	2	-	2
Course Code	**201HS4T06 - Management and Organizational Behavior**	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	Explain a range of organizational behavior models key elements and roles.	-	-	-	-	-	-	-	-	1	1	1	1	-	-
CO2	Analyze the behavior of individuals and groups in organizations in terms of organizational behavior, interpersonal behavior and personality traits concepts.	-	-	-	-	-	-	-	-	1	1	-	1	-	-

	CO Statements	POs												PSOs	
CO3	Utilize various stress and emotional organizational behavior concepts, models and theories to real life management situations through case analysis.	-	-	-	-	-	-	-	-	1	1	-	1	-	-
CO4	Make use of organizational communication and organization culture to understanding of organizational communication and culture to cope up with the organization better way	-	-	-	-	-	-	-	-	1	1	1	1	-	-
CO5	Classify the different groups and teams in the organization and its features for dealing these groups in a good way for better result and motivate them	-	-	-	-	-	-	-	-	1	1	-	1	-	-
Course Code	201ES4L16 - Mechanical and Materials Science and Engineering Lab	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	Demonstrate the material mechanical behavior under various direct loads	2	1	-	-	-	-	3	-	-	3	2	-	-	-
CO2	Calculate the mechanical strength of cube	3	2	-	-	-	-	3	-	-	3	3	-	-	-
CO3	Demonstrate the materials mechanical behavior under various indirect loads.	2	1	-	-	-	-	3	-	-	3	2	-	-	-
CO4	Analyze the Structure of pure metals and alloys	0	3	-	-	-	-	3	-	-	3	2	-	-	-
CO5	Estimate the hardness of various treated and untreated steels	2	0	-	-	-	-	3	-	-	3	2	-	-	-
Course Code	201PT4L04 - Heat Transfer Operations Lab	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	Utilize the basics of experimental techniques for heat transfer measurements.	-	-	-	-	-	-	-	-	3	2	-	2	-	2
CO2	Demonstrate the heat transfer equipment like heat exchangers	-	-	-	-	-	-	-	-	3	2	-	2	-	2
CO3	Analyze process experimental data and obtain correlations to predict heat transfer coefficients for design of heat transfer systems	-	-	-	-	-	-	-	-	3	2	-	2	-	2
CO4	Interpret the experiments at R & D level in the industry	-	-	-	-	-	-	-	-	3	2	-	2	-	2

	CO Statements	POs												PSOs	
CO5	Relate the professional and ethical responsibilities in the field of heat transfer	-	-	-	-	-	-	-	-	3	2	-	2	-	2
Course Code	**201PT4L05 - Petroleum Geology Lab**	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	Identify source, reservoir, cap rocks, different types of hydrocarbon traps	-	-	-	-	-	-	-	-	2	2	-	1	2	-
CO2	Measure the porosity and permeability of reservoir rocks	-	-	-	-	-	-	-	-	2	2	-	1	2	-
CO3	To make use of the maps to study the reservoir area, well logs for well correlation	-	-	-	-	-	-	-	-	2	2	-	1	2	-
CO4	Construct geological model of petroleum system	-	-	-	-	-	-	-	-	2	2	-	1	2	-
CO5	Find the distinction between clastic and non-clastic reservoir rocks, Identify the oil-water contact	-	-	-	-	-	-	-	-	2	2	-	1	2	-
Course Code	**201PT4L05 - Skill oriented course-II Python Programming**	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	Develop programs using conditional and iterative statements	3	2	1	-	3	-	-	3	-	-	3	-	-	-
CO2	Make use of different data structures in solving complex problems	3	2	1	-	3	-	-	3	-	-	-	-	-	-
CO3	Apply the concepts of functions and files in solving real time applications	3	2	1	-	3	-	-	3	-	-	3	-	-	-
CO4	Build applications for handling exceptions	3	3	1	2	3	-	-	3	-	-	3	-	-	-
CO5	Develop GUI applications	3	2	1	-	3	-	-	3	-	-	3	-	-	-
Course Code	**201MC4T04 - Essence of Indian Traditional Knowledge**	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	Identify the concept of Traditional knowledge and its importance.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	Explain the need and importance of protecting traditional knowledge	-	-	-	-	-	-	-	-	-	-	-	-	-	-

	CO Statements	POs												PSOs	
CO3	Illustrate the various enactments related to the protection of traditional knowledge	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO4	Interpret the concepts of Intellectual property to protect the traditional knowledge.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO5	Explain the importance of Traditional knowledge in Agriculture and Medicine	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Course Code	201PT4H01 - Depositional Environments Of Sedimentary Basins Of India	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	Explain the general facts of the earth	2	-	-	-	-	-	-	-	-	-	-	1	2	-
CO2	Explain how deltas are formed	2	-	-	-	-	-	-	-	-	-	-	1	2	-
CO3	Explain how sedimentary basin are formed.	2	-	-	-	-	-	-	-	-	-	-	1	2	-
CO4	Analyze each basin formation	2	-	-	-	-	-	-	-	-	-	-	1	2	-
CO5	Analyze the each basin formation.	2	-	-	-	-	-	-	-	-	-	-	1	2	-
Course Code	201PT4H02 - Advanced Natural Gas Engineering	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	Understand basic fluid phase behavior	3	2	-	-	-	-	-	-	-	-	-	2	3	-
CO2	Determine the physical properties of natural gas	3	2	-	-	-	-	-	-	-	-	-	2	2	-
CO3	Understand of scientific and engineering principles and their problem in natural gas engineering	3	2	-	-	-	-	-	-	-	-	-	2	2	-
CO4	Formulate solution to natural gas engineering problems by scientific and engineering knowledge	3	2	-	-	-	-	-	-	-	-	-	2	2	-
CO5	Design and conduct experiment, and interpret and analyze data	3	2	-	-	-	-	-	-	-	-	-	2	3	-

	CO Statements	POs												PSOs	
Course Code	**201PT4H03 - Coal Bed Methane Engineering**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Summarize the necessity of CBM exploitation and different geological influences on coal formation	3	2	-	-	-	-	-	-	-	-	-	2	2	-
CO2	Apply the concept of isotherms for the indirect and direct determination of gas content in CBM reservoir	3	2	-	-	-	-	-	-	-	-	-	2	2	-
CO3	Make use of different reservoir engineering concepts to analyze the CBM reservoir	3	2	-	-	-	-	-	-	-	-	-	2	2	-
CO4	Select the different geophysical logs for formation evaluation and well completion techniques suitable for CBM reservoirs	3	2	-	-	-	-	-	-	-	-	-	2	2	-
CO5	Select the types of hydraulic fracturing fluids and produced mine water disposal techniques suitable for CBM reservoirs	3	3	-	-	-	-	-	-	-	-	-	2	2	-
Course Code	**201PT4M01 - Basic Concepts In Hydrocarbon Exploration**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Apply the different geological approaches for exploration of oil and gas deposits	3	-	-	-	-	-	-	-	-	-	-	-	2	-
CO2	Utilize the principles of gravity prospecting to explore the subsurface rocks favorable for hydrocarbon deposits	3	-	-	-	-	-	-	-	-	-	-	-	2	-
CO3	Make use of principles of magnetic method to explore sedimentary basins	3	-	-	-	-	-	-	-	-	-	-	-	2	-
CO4	Apply the method of seismic refraction and reflection to estimate the velocity and thickness of different subsurface geological layers	3	-	-	-	-	-	-	-	-	-	-	-	2	-
CO5	Make use of principles of different cased hole and production logging techniques to decipher subsurface properties.	3	-	-	-	-	-	-	-	-	-	-	-	2	-
Course Code	**201PT4M02 - Fundamentals of Earth Science**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Explain the general facts of the earth.	-	2	-	-	-	-	-	-	-	-	-	1	-	2
CO2	Analyze the different processes for the formation of land forms.	-	2	-	-	-	-	-	-	-	-	-	1	-	2
CO3	Analyze the different erosion cycles and their products.	-	2	-	-	-	-	-	-	-	-	-	1	-	2

	CO Statements	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
		POs												PSOs	
CO4	Compare and classify various kinds of rocks.	-	2	-	-	-	-	-	-	-	-	-	1	-	2
CO5	Explain how basins and deltas are formed.	-	2	-	-	-	-	-	-	-	-	-	1	-	2
Course Code	201PT4M03 - Fluid Flow Through Porous Media	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	Apply basic concepts of Porous Media	-	2	-	-	-	-	-	-	-	-	-	1	-	2
CO2	Apply the concepts of Reynold's Number for Porous media	-	2	-	-	-	-	-	-	-	-	-	1	-	2
CO3	Apply and estimate the reserves based on General Material Balance Equation.	-	2	-	-	-	-	-	-	-	-	-	1	-	2
CO4	Apply the theory's in displacement mechanisms	-	2	-	-	-	-	-	-	-	-	-	1	-	2
CO5	Apply Basic Heat Transfer for flow through Deformable Porous Media	-	2	-	-	-	-	-	-	-	-	-	1	-	2