Vision of the Department:

The vision of the department is to advance undergraduate and postgraduate programs to achieve national and international recognition, exemplifying the dual commitment to education and research.

Mission of the Department:

To educate the next generation Engineers of Petroleum.
To prepare the students for leadership for Petroleum Engineering profession but also for diversified careers.
To create knowledge and to provide multidisciplinary solutions to broad societal problems.
To foster and encourage the pursuit of new knowledge and innovative research in Petroleum Sciences and Engineering in partnership with Industry.
To create a vibrant research environment in collaboration with National and International Institutes of Excellence.

Program Educational Objective (PEO)

PEO 1
Shall apply fundamental and advanced knowledge and skills in basic and engineering sciences and in Petroleum Engineering, to find suitable solutions to technological challenges and problems in various areas of engineering and real life areas using modern tools.

PEO 2
Shall practice Petroleum Engineering in a responsible, professional, and dedicated manner by functioning effectively either as an individual or as a member of multi – disciplinary teams, for the benefit of the industry and society at large without detriment to environment and sustainable development.
PEO 3
Shall acquire good job opportunities in industries or pursue higher studies.

PEO 4
Shall develop the ability to engage in lifelong learning, research and develop in a responsible, professional, dedicated and ethical manner for the benefit of the industry and society at large.

Program 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 modelling 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.

Program Specific Outcomes (PSO'S)

PSO1
Professional Skills: An ability to understand the basic concepts in Petroleum Engineering and to apply them to various areas, like production, drilling, reservoir etc., in the design and implementation of complex systems

PSO2
Problem-Solving Skills: An ability to solve complex Petroleum Engineering problems, using the latest hardware and software tools, along with analytical skills to arrive the cost effective and appropriate solutions.

II YEAR

Course Code	PETROLEUM GEOLOGY
PC2127T01	

COURSE OUTCOMES

After completion of course, students would be able to:

CO1 Discern the dimension of the earth structure, composition, origin of the earth. It deals essence of scientific studies dealing with the origin, age, structure of the earth and with the evolution, modification, and extinction of various surface and subsurface physical features.

CO2 Be impressed by the fact that the subject is not static and will more likely keep his/her mind open to new ideas.

CO3 Understand the origin of different kinds of igneous, sedimentary, metamorphic rocks that can be understood in terms of their tectonic setting.

CO4 Gain the knowledge on fundamentals of sedimentary basins.

CO5 Identify different source rocks from which hydrocarbons are generated.

Course Code	CHEMICAL PROCESS PRINCIPLES
PC2108T01	

COURSE OUTCOMES

After completion of course, students would be able to:

CO1 Learn all background information/charts/datasheets required to carry out process calculations. Some of these are vapor pressure correlations, latent heat correlation, steam tables, psychometric charts, enthalpy-concentration diagrams etc.,

CO2 Formulate and solve simple and moderately complex process calculations associated to industrially prominent chemical processes and technologies.

CO3 Conceptualize an integrated methodology that encompasses the knowledge in other subjects (Physical Chemistry, Thermodynamics and Mathematics) and MS Excel for a systematic and structured approach towards chemical process calculations.

CO4 Analyze chemical processes through the power of modeling and computation. These include back-calculation methods, inventory losses and revenue related assessment etc.

Course Code	MOMENTUM TRANSFER
PC2127T02	

COURSE OUTCOMES

After completion of course, students would be able to:

C01 Analyze fluid flow in circular and non-circular conduits.

CO2 Do calculations associate to the estimation of friction factor and pressure drop in circular conduits.

CO3 Do calculations involving Bernoulli's equation for the transport of acidic, alkaline,

hydrocarbon and miscellaneous incompressible fluids in pipelines.
CO4 Calculate the pressure drops and energy requirements associated to compressible fluid flow in circular and rectangular ducts.
CO5 Estimate pressure drop in packed and fluidized beds.

Course Code	MOMENTUM TRANSFER LAB
PC2127P02	

COURSE OUTCOMES

After completion of course, students would be able to:
CO1 Collect and analyze data using momentum transfer principles and experimentation methods.
CO2 Prepare reports following accepted writing and graphical techniques.
CO3 Perform exercises in small teams.
CO4 Demonstrate principles discussed in momentum transfer lecture course.
CO5 Demonstrate appropriate work habits consistent with industry standards.

Course Code	PETROLEUM GEOLOGY LAB
PC2127P01	

COURSE OUTCOMES

After completion of course, students would be able to:
CO1Understand the basics of sedimentary and carbonate reservoir rock.
CO2 Plotting litho stratigraphic column and geological cross-section
CO3 Understand the basics of well correlation used SP and Gamma ray mapping.
CO4 Student can be in a position to plot contour lines and litho stratigraphic column.
CO5 Identifying and understanding source rock parameters.

Course Code	PROCESS HEAT TRANSFER
PC2208T04	

COURSE OUTCOMES

After completion of course, students would be able to:
CO1 Understand the basic laws of heat transfer.
CO2 Account for the consequence of heat transfer in thermal analyses of engineering systems.
CO3 Analyze problems involving steady state heat conduction in simple geometries.
CO4 Develop solutions for transient heat conduction in simple geometries.
CO5 Obtain numerical solutions for conduction and radiation heat transfer problems.

Course Code	MATERIALS SCIENCE & ENGINEERING
ES2227T02	

COURSE OUTCOMES

After completion of course, students would be able to:

CO1 Equipped with knowledge to understand material selection diagram,

CO2 Evaluation of equipment life and prediction of life of the equipment.

CO3 Acquiring the abilities to carryout reliability studies.

CO4Ready to carryout equipment failure analysis.

CO5Propose the remedial measures.

Course Code	PETROLEUM EXPLORATION
PC2227T01	

COURSE OUTCOMES

After completion of course, students would be able to:

CO1 It gives insight to the students to have a broad based understanding of the seismic exploration, viz. its acquisition methods, processing and interpretation, as they have already had geology in IInd year course. The knowledge of these methods will go a long way along with the other subject i. e., well completion, reservoir engineering so that they can opt for upstream industry jobs.

CO2 Students should be able to interpret GM & Seismic data for identification of oil bearing structures.

Course Code	THERMODYNAMICS FOR PETROLEUM ENGINEERS
PC2227T02	

COURSE OUTCOMES

After completion of course, students would be able to:

CO1 Become conversant with all the basic concepts of thermodynamics and gain working knowledge in open, closed, isothermal, isobaric and isentropic processes.

CO2 Use thermodynamic tables and diagrams for the estimation of internal energy, specific volume, enthalpy and entropy.

CO3 Apply equations such as ideal gas law, Vander Waal's equation and other cubic equations of state for the characterization of process parameters.

CO4 Determine efficiencies of turbines, pumps, compressors, blowers and nozzles.

CO5 Rigorously use residual and excess Gibbs free energy models for design of oil and natural gas processing systems.

Course Code	INSTRUMENTATION, PROCESS DYNAMICS & CONTROL
PC2227T03	

COURSE OUTCOMES

After completion of course, students would be able to:

CO1 Understand the basic elements of an instrument and its characteristics.
CO2 Become familiar with various types of instruments for the measurement of various process variables like temperature, pressure, vacuum, head, and density.
CO3 Usage of partial fractions and Laplace transforms for converting ordinary differential equations into simple algebraic equations which are easier to solve.
CO4 Write different types of unsteady and steady state balances
CO5 Describe a process, how it works and what the control objectives are.

Course Code	PROCESS HEAT TRANSFER LAB
PC2208T04	

COURSE OUTCOMES

After completion of course, students would be able to:
CO1 Understand the basics of experimental techniques for heat transfer measurements.
CO2 Operate the heat transfer equipment like heat exchangers.
CO3 Process experimental data and obtain correlations to predict heat transfer coefficients for design of heat transfer systems.
CO4 Conduct the experiments at R & D level in the industry
CO5 Understand the professional and ethical responsibilities in the field of heat transfer.

PC2227T03	**INSTRUMENTATION, PROCESS DYNAMICS & CONTROL LAB**

COURSE OUTCOMES

After completion of course, students would be able to:
CO1 Estimate the dynamic characteristics of first and second order systems.
CO2 Apply the advanced control methods used for complex processes in the industries.
CO3 Screen and suggest controllers like On/Off, P, PI, PD and PID for process systems.
CO4 Identify the stability of the system.

III YEAR

Course Code	WELL LOGGING & FORMATION EVALUATION
PC31027T01	

COURSE OUTCOMES

After completion of course, students would be able to:

Apply the basic concepts of logging.

CO1 Delineate hydrocarbons through direct and indirect logging methods.

CO2 Apply the concepts to determine the formation lithology through logs like S.P, G.R etc.

CO3 Learn about the depositional environment with the help of Gamma rays spectroscopy and Dip-meter tools.

Course Code	DRILLING & WELL COMPLETIONS
PC31027T02	

COURSE OUTCOMES

After completion of course, students would be able to:

CO1 Plan the drilling of a well, using various drilling equipment.

CO2 Assess the application of drilling fluids.

CO3 Apply the hydraulics of drilling fluids for different situations.

CO4 Design different types of casings and cementation.

CO5 Use the different tools for directional drilling, fishing, stuck pipe and well control.

Course Code	PETROLEUM RESERVOIR ENGINEERING-I
PC31027T03	

COURSE OUTCOMES

After completion of course, students would be able to:

CO1 Apply the basic concepts of reservoir engineering.

CO2 Calculate PVT properties for oil & gas.

CO3 Perform the material balance for oil & gas reservoirs.

CO4 Apply the concepts of Darcy's law.

CO5 Adopt the diffusivity equation to solve reservoir engineering problems.

Course Code	**PETROLEUM PRODUCTION ENGINEERING**
PC31027T04	

COURSE OUTCOMES

After completion of course, students would be able to:

CO1 Apply the concepts in petroleum production engineering.

CO2 Perform the calculations in reservoir deliverability and well bore performance.

CO3 Perform the calculations for choke performance in oil & gas wells, well deliverability, and production forecasting and production decline analysis.

CO4 Design and assess the application of equipment for various artificial lift systems.

CO5 Design and execute matrix acidizing and hydro-fracturing operations

Course Code	CBM RESERVOIR ENGINEERING (PROFESSIONAL ELECTIVE-I)
PE31027T01A	

COURSE OUTCOMES

After completion of course, students would be able to**:**

CO1 Assess the CBM reservoirs for commercial exploitation.

CO2 Determine the coal properties for evaluation of coal formation.

CO3 Construct of Langmuir isotherms for the CBM production behavior.

CO4 Estimate the CBM reserves.

CO5 Carry out drilling and completions of CBM wells.

Course Code	EQUATION OF STATE AND PVT ANALYSIS (PROFESSIONAL ELECTIVE-I)
PE31027T01B	

COURSE OUTCOMES

After completion of course, students would be able to:

CO1 Assess the phase behavior of hydrocarbon systems.

CO2 Characterize the hydrocarbon-plus fractions for the PVT analysis.

CO3 Calculate the PVT properties of reservoir fluids.

CO4 Apply the concepts of equations of state and phase equilibria to the petroleum fluids.

CO5 Assess the issues related to flow assurance and accordingly design the flow systems.

Course Code	MATHEMATICAL METHODS FOR PETROLEUM ENGINEERS - LABORATORY
PC31027P01	

COURSE OUTCOMES

After completion of course, students would be able to:

CO1 The students are able to write MATLAB code and solve typical problems encountered in petroleum engineering.

Course Code	DRILLING FLUIDS LABORATORY
PC31027P02	

COURSE OUTCOMES

After completion of course, students would be able to:

CO1 Assess the quality of various muds and their applications in drilling safely accounting the desired parameters.

CO2 Carry out consultation jobs for healthy construction of open oil / gas wells.

Course Code	DRILLING SIMULATION– LABORATORY
PC31027P03	

COURSE OUTCOMES

After completion of course, students would be able to:

CO1 Familiarize with abnormal drilling operations and handle any drilling situation

CO2 Conversant with the BOP, control panel, remote control panel etc.

CO3 Identify the abnormal activities much in advance and plan to prevent the Kick, blowout etc.

CO4 Become a drilling engineer by improving the rate of drilling even in critical conditions.

Course Code	SOCIALLY RELEVANT PROJECT FOR PETROLEUM ENGINEERS
PC3100P01	

COURSE OUTCOMES

After completion of course, students would be able to:

CO1 Assess the needs and problems of society.

CO2 Design and implement the system in the project.

CO3 Develop a sense of social and civic responsibility.

CO4 Acquire leadership qualities to work in a team.

CO5 Develop competence required for working together and sharing responsibility.

Course Code	INDUSTRIAL VISITS (LOCAL & OUTSIDE)
PT3100P01	

COURSE OUTCOMES

After completion of course, students would be able to:

CO1 Differentiate between the academic training and its relevance to industry.

CO2 Understand the industrial safety measures.

Course Code	MOOCS (NPTEL/ SWAYAM) FOR HONORS/MINORS DEGREE

COURSE OUTCOMES

After completion of course, students would be able to:

CO1 Overcome the digital divide in acquiring fast developing technologies / knowledge and be part of digital revolution.

CO2 Acquire subject specific expert knowledge from National Resource Pool.

CO3 Understand his /her academic / professional priorities for future development.

Course Code	PETROLEUM REFINERY & PETROCHEMICAL ENGINEERING
R19PCC3201	

COURSE OUTCOMES

After completion of course, students would be able to:

CO1 Estimate the quantities of various petroleum products obtained from various types of crude oil processing.

CO2 Analyze and design the various petroleum refinery processes including primary, secondary, treatment and supporting processes.

CO3 Assess the various aspects of environmental pollution to design the control and waste disposal methods.

CO4 Design the processes and equipment for various petrochemical products.

Course Code	
R19PCC3202	**PETROLEUM RESERVOIR ENGINEERING-II**

COURSE OUTCOMES

After completion of course, students would be able to:

CO1 Apply the fundamentals as well as advanced topics to derive diffusivity equation and its solutions applicable to oil and gas wells.

CO2 Analyze oil and gas well test data to evaluate productivity and reservoir parameters.

CO3 Apply the concepts of gas and water coning to calculate critical rates and break through times.

CO4 Estimate the water influx in oil and gas reservoirs using steady state and un-steady state equations.

CO5 Apply the principles of water and gas flooding to improve recoveries.

Course Code	**Petroleum Exploration and Engineering (OPEN ELECTIVE-I for other branches)**
R19OEC3203A	

COURSE OUTCOMES

After completion of course, students would be able to:

CO1 Assess the deposits of crude oil, natural gas, hydrates, heavy oils and oil sands & their exploitation.

CO2 Apply the basics of geology, formation of petroleum, migration, entrapment, shale oil and gas in the exploitation of oil and gas.

CO3 Analyse petroleum exploration and drilling operations.

CO4 Apply the concepts of production from onshore and offshore reservoirs.

CO5 Evaluate the accidents during drilling and production.

Course Code	**FUNDAMENTALS OF OFFSHORE OPERATIONS OPEN ELECTIVE-II (for other branches)**
R19OEC3203B	

COURSE OUTCOMES

After completion of course, students would be able to:

CO1 Apply the basic concepts of offshore operations of oil and gas.

CO2 Analyze the details of various types of drilling rigs and their structures.

CO3 Apply the concepts of drilling to drill an offshore well.

CO4 Carry out various techniques of drilling of exploration & development wells and completions.

CO5 Apply the concepts of production and workover operations to offshore wells

Course Code	**FUNDAMENTALS OF OIL AND GAS PRODUCTION OPEN ELECTIVE-II (for other branches)**
R19OEC3203C	

COURSE OUTCOMES

After completion of course, students would be able to:

CO1 The history of oil and gas production.

CO2 The concepts of reservoir engineering and horizontal drilling.

CO3 The biogenic and abiogenic theories of oil and gas formation.

CO4 The concepts of logging, testing and completing oil wells.

CO5 The properties of reservoir fluids and hydrocarbon phase diagrams.

Course Code	PETROLEUM ASSET MANAGEMENT (PROFESSIONAL ELECTIVE-II)
R19PEC3204A	

COURSE OUTCOMES

After completion of course, students would be able to:

CO1 Apply the principles of asset management for oil and gas industry.

CO2 Evaluate the processes and modeling paradigms needed to develop the skills to increase reservoir output, profitability and decrease speculation.

CO3 Develop modern reservoir management teams keeping in mind the technical diversity.

CO4 Implement the concepts of reservoir management.

Course Code	ACIDIZING CONCEPTS AND DESIGN (PROFESSIONAL ELECTIVE-II)
R19PEC3204B	

COURSE OUTCOMES

After completion of course, students would be able to:

CO1 Assess the applications of inorganic acids and organic acids for acidizing for different formations.

CO2 Carry out the acid treatment design considering the aspects of drilling, completion, work-over and production.

CO3 Consider the rock and fluid properties for the design of acidization.

CO4 Use nitrogen in acidizing based on fluid properties.

CO5 Use the different acid systems and additives for fracturing.

Course Code	PRODUCTION OPTIMIZATION USING NODAL ANALYSIS (PROFESSIONAL ELECTIVE-III)
R19PEC3205A	

COURSE OUTCOMES

After completion of course, students would be able to:

CO1 Carry out the nodal analysis for normal production wells and artificial lift wells.

CO2 Calculate the performance of the oil and gas reservoirs.

CO3 Apply the concepts of flow in pipes and restrictions during the nodal analysis.

CO4 Design the artificial lift systems using nodal analysis.

CO5 Apply the nodal analysis to compute performance of single and multi-well production systems including injection wells.

Course Code	FUNDAMENTALS OF LIQUEFIED NATURAL GAS (PROFESSIONAL ELECTIVE-III)
R19PEC3205B	

COURSE OUTCOMES

After completion of course, students would be able to:

CO1 Assess the world wide LNG industry.

CO2 Design and develop the base load LNG plants.

CO3 Assess the requirement of supporting functional units in LNG plants.

CO4 Screen and select the liquefaction process technologies of natural gas for LNG project.

CO5 Oversee the installation, commissioning different functional units in the receiving terminals at marine facility.

Course Code	
R19PCC3207	**PETROLEUM RESERVOIR ENGINEERNG LABORATORY**

COURSE OUTCOMES

After completion of course, students would be able to:

CO1 Perform experiments to measure, interpret the reservoir rock and fluid property data.

CO2 Assess the reservoir performance using the experimental data.

Course Code	
R19PCC3208	**PETROLEUM ANALYSIS LABORATORY**

COURSE OUTCOMES

After completion of course, students would be able to:

CO1 Use the analysis of crude oil and its products in the design of refinery operations.

CO2 Generate distillation characteristics (ASTM curves) of crude oil, diesel, gasoline and kerosene for designing primary distillation columns.

CO3 Assess the limits of water content in different petroleum products while meeting the specifications.

CO4 Screen and select the appropriate material construction for refinery process units.

Course Code	
R19PT3211	**SUMMER INTERNSHIP (4-6 WEEKS)**

COURSE OUTCOMES

After completion of course, students would be able to:

CO1 Work safely in industrial environment.

CO2 Work with various interest groups, disciplines, professionals, managers and technicians etc.

CO3 Polish the engineering skills by applying the practical knowledge in day-to-day operations, trouble-shooting and minor-modifications.

CO4 Build relations between university and industry that helps mutual collaboration and cooperation over long-term.

CO5 Develop/strengthen the basic skills of interviewing, analysis, report writing, communication, decision-making, and problem solving.

Course Code	
	MOOCS (NPTEL/ SWAYAM) FOR HONORS/MINORS DEGREE

COURSE OUTCOMES

After completion of course, students would be able to:

CO1 Overcome the digital divide in acquiring fast developing technologies / knowledge and be part of digital revolution.

CO2 Acquire subject specific expert knowledge from National Resource Pool.

CO3 Understand his /her academic / professional priorities for future development.

IV YEAR

Course Code	
R19PCC4101	**HSE IN PETROLEUM INDUSTRY**

COURSE OUTCOMES

After completion of course, students would be able to:

CO1 Assess the environment issues.

CO2 Design safe drilling fluids and control the toxic effects of drilling fluids on environment.

CO3 Devise different methods drill cuttings disposal.

CO4 Assess the different methods for treatment of produced water and select appropriate methods.

CO5 Implement the oil mines regulations in petroleum operations.

Course Code	
R19PCC4102	**DESIGN AND OPERATION OF SURFACE FACILITIES**

COURSE OUTCOMES

After completion of course, students would be able to:

CO1 Assess the requirement of surface facilities for oil and gas processing.

CO2 Design various types of separators.

CO3 Design desalting, emulsifying, and heater treater equipment.

CO4 Design the vapor recovery system.

CO5 Assess the various methods of produced water treatment and their design.

Course Code	
R19PEC4103A	**ENHANCED OIL RECOVERY (EOR) TECHNIQUES (PROFESSIONAL ELECTIVE-IV)**

COURSE OUTCOMES

After completion of course, students would be able to:

CO1 Assess the secondary / tertiary recovery methods required for specific crude oil reservoirs.

CO2 Design the injection and CO2 flooding systems.

CO3 Apply the basic concepts of polymer flooding for its design.

CO4 Apply the basic concepts of alkaline and surfactant flooding for their design.

CO5 Design the steam flooding, in-situ combustion and microbial systems for enhanced oil recovery.

Course Code	
R19PEC4103B	**ADVANCED WELL COMPLETION ENGINEERING (PROFESSIONAL ELECTIVE-IV)**

COURSE OUTCOMES

After completion of course, students would be able to:

CO1 Apply the basic concepts of well reservoir engineering in well completions.

CO2 Screen the various types of well completions.

CO3 Analyze the factors affecting well completions.

CO4 Select the suitable materials of construction for well completion equipment.

CO5 Carry out the stress analysis for the system design like tube design.

Course Code	
R19PEE4104A	**SUBSEA ENGINEERING (PROFESSIONAL ELECTIVE-V)**

COURSE OUTCOMES

After completion of course, students would be able to:

CO1 Assess the aspects of subsea engineering and field development.

CO2 Apply the concepts of subsea distribution system, control and power supply.

CO3 Plan and select the subsea vessels for installation and positioning.

CO4 Apply the concepts of subsea system engineering including flow assurance, hydraulics and operability.

CO5 Assess the issues related to wax, asphaltenes and hydrates.

Course Code	
R19PEE4104B	**PETROLEUM ECONOMICS, POLICIES AND REGULATIONS (PROFESSIONAL ELECTIVE-V)**

COURSE OUTCOMES

After completion of course, students would be able to:

CO1 Assess the importance of petroleum sector in the world economy, both the macro and micro-economic environment and as applicable to India.

CO2 Apply the principles, methods and techniques of petroleum engineering economics in the evolution of petroleum projects.

CO3Apply the concepts of managing, mitigating uncertainty and risk in the financial aspects.

CO4 Value the petroleum assets.

CO5 Apply the concepts of portfolio management.

Course Code	
R19OEC4105A	**CORROSION CONTROL IN PETROLEUM INDUSTRY (OPEN ELECTIVE-II for other branches)**

COURSE OUTCOMES

After completion of course, students would be able to:

CO1 Assess the concepts of electrochemistry and materials science relevant to corrosion phenomena.

CO2 Assess the causes of mechanisms of various types of corrosion.

CO3 Apply the methods for predicting, measuring, and analyzing corrosion performance of materials.

CO4 Implement the practices for the prevention and remediation of corrosion.

CO5 Evaluate the various corrosion resistant materials for the application in oil and gas industry.

Course Code	
R19OEC4105B	**UNCONVENTIONAL HYDROCARBON RESOURCES (OPEN ELECTIVE-II for other branches)**

COURSE OUTCOMES

After completion of course, students would be able to:

CO1 Assess the various sources of CBM, shale gas and oil and natural gas hydrates.

CO2 Design and operate the CBM systems.

CO3 Apply the concepts of shale gas and oil reservoirs for exploitation.

CO4 Device exploration methods for natural gas hydrates.

CO5 Apply the methodologies for the extraction of gas from hydrates.

Course Code	
R19PCC4106	**PETROLEUM EQUIPMENT DESIGN & SIMULATION – LABORATORY**

COURSE OUTCOMES

After completion of course, students would be able to:

CO1 Design and simulate the two-phase and three phase separators.

CO2 Design and simulate compressors and flash vaporization units.

CO3 Design and simulate absorber-stripper unit for removal of CO2 and H2S from natural gas.
Size /rate the pipeline & pumping systems.

CO4 Do thermal sizing or rating of shell & tube exchangers as per TEMA specifications and API guidelines.

Course Code	
R19PCC4107	**PETROLEUM RESERVOIR SIMULATION– LABORATORY**

COURSE OUTCOMES

After completion of course, students would be able to:

CO1 Simulate reservoirs for different production scenarios to find an optimal one before the reservoir is actually put on production.

CO2 Carry out reservoir simulation with different models for existing reservoirs to study production decline and production forecasts.

CO3 Carry out reservoir simulation with different models for new reservoirs to maximize recovery of oil and gas to make investment decisions.

CO4 Present results of the simulation studies in a written report.

Course Code	
R19PR4108	**PRESENTATION/SEMINAR (SUMMER INTERNSHIP PROGRAM REPORT)**

COURSE OUTCOMES

After completion of course, students would be able to:

CO1 Prepare the documents/reports in the desired formats/the power point presentations very effectively.

CO2 Present the PPTs with confidence in the technical groups/seminars/meetings.

CO3 Enhance written and oral communication skills.

CO4 Share the technical knowledge and experience to colleagues in the plant and elsewhere.

Course Code	
R19PR4109	**PROJECT WORK (PHASE – 1)**

COURSE OUTCOMES

After completion of course, students would be able to:

CO1 Carry out literature survey for any project.

CO2 Do research work by bridging the gaps in the existing research/technology.

CO3 Write the problem statements of any projects.

CO4 Develop methodology to make calculations/simulations.

CO5 Make the interim technical reports for the preliminary investigations.

Course Code	MOOCS (NPTEL/ SWAYAM) FOR HONORS/MINORS DEGREE

COURSE OUTCOMES

After completion of course, students would be able to:

CO1 Overcome the digital divide in acquiring fast developing technologies / knowledge and be part of digital revolution.

CO2 Acquire subject specific expert knowledge from National Resource Pool.

CO3 Understand his /her academic / professional priorities for future development.

Course Code	OFFSHORE DEEPWATER DRILLING AND PRODUCTION (PROFESSIONAL ELECTIVE-VI)
R19PEC4201A	

COURSE OUTCOMES

After completion of course, students would be able to:

CO1 Assess the offshore environment for various operations.

CO2 Assess the application of offshore platforms for drilling and production.

CO3 Apply the stability criteria for designing offshore platforms.

CO4 Analyze the methods of offshore drilling, completion and production operations in comparison with onshore operations.

CO5 Apply the deep water technology in the exploitation of offshore oil and gas.

Course Code	PIPELINE ENGINEERING (PROFESSIONAL ELECTIVE-VI)
R19PEC4201B	

COURSE OUTCOMES

After completion of course, students would be able to:

CO1 Apply the elements of pipeline design, route selection & survey and geotechnical guidelines for construction.

CO2 Design pipelines for natural gas transmission.

CO3 Design of natural gas compression systems.

CO4 Design of liquid pumping systems.

CO5 Use the different methods of pipeline protection, instrumentation and pigging for monitoring pipeline systems.

Course Code	APPLIED MATHEMATICS IN RESERVOIR ENGINEERING (PROFESSIONAL ELECTIVE-VII)
R19PEC4202A	

COURSE OUTCOMES

After completion of course, students would be able to:

CO1 Analyze and solve reservoir engineering problems using Laplace Series.

CO2 Analyze and solve reservoir engineering problems using Fourier series.

CO3 Apply the analytic function of a complex variable, Cauchy integral theorem and residue theorem to solve contour integrations.

CO4 Be competent in solving linear PDEs using classical analytical solution methods.

Course Code	ADVANCES IN SEISMIC EXPLORATION (PROFESSIONAL ELECTIVE-VII)
R19PEC4202B	

COURSE OUTCOMES

After completion of course, students would be able to:

CO1 Apply the concepts of seismic prospecting.

CO2 Process and interpret seismic data.

CO3 Apply the seismic attributes to calculate reservoir parameters.

CO4 Apply the OBC (Ocean Bottom Cable) for improving data acquisition.

CO5 Apply 2D-3C and 3D-3C concepts for reservoir modelling.

Course Code	PROJECT WORK (PHASE-2)
R19PR4204	

COURSE OUTCOMES

After completion of course, students would be able to:

CO1 Carry out design and simulation of equipment and processes required for the project.

CO2 Be competent in experimental work.

CO3 Integrate the knowledge gained in gathering the information required for the project.

CO4 Identify the gaps between theory and practice.

CO5 Improve the personal qualities like maturity, initiative and creativity.

Course Code	MOOCS (NPTEL/ SWAYAM) FOR HONORS/MINORS DEGREE

COURSE OUTCOMES

After completion of course, students would be able to:

CO1 Overcome the digital divide in acquiring fast developing technologies / knowledge and be part of digital revolution.

CO2 Acquire subject specific expert knowledge from National Resource Pool.

CO3 Understand his /her academic / professional priorities for future development.