



JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA
KAKINADA – 533 003, Andhra Pradesh, India

DEPARTMENT OF PETROLEUM ENGINEERING

COURSE STRUCTURE AND SYLLABUS

For UG – R20

B. TECH - PETROLEUM ENGINEERING

(Applicable for batches admitted from 2020-2021)



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DEPARTMENT OF PETROLEUM ENGINEERING
COURSE STRUCTURE

I Year – I SEMESTER

S. No	Course Code	Subjects	L	T	P	Credits
1		Mathematics - I	3	0	0	3
2		Engineering Chemistry	3	0	0	3
3		Communicative English	3	0	0	3
4		Engineering Drawing	1	0	4	3
5		Programming for Problem Solving Using C	3	0	0	3
6		English Communication Skills Laboratory	0	0	3	1.5
7		Engineering Chemistry LAB	0	0	3	1.5
8		Programming for Problem Solving Using C Lab	0	0	3	1.5
9		Constitution of India	2	0	0	0
Total Credits						19.5

I Year – II SEMESTER

S. No	Course Code	Subjects	L	T	P	Credits
1	HS1201	Mathematics – II	3	0	0	3
2	BS1203	Engineering Physics	3	0	0	3
3	BS1208	Engineering Mechanics	3	0	0	3
4	ES1204	Elements of Mechanical Engineering	3	0	0	3
5	PT1201	Basic Electrical & Electronics Engineering	3	0	0	3
6	HS1203	Engineering Workshop & IT Workshop LAB	0	0	3	1.5
7	BS1209	Engineering Physics LAB	0	0	3	1.5
8	ES1220	Basic Engineering (Mechanical & Electrical) LAB	0	0	3	1.5
9	PR1201	Professional Ethics & Human Values	2	0	0	0
Total Credits						19.5



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II Year – I SEMESTER

S. No	Category	Course Title	Hours per week			Credits
			L	T	P	
1	BS	Mathematics – III	3	0	0	3
2	PCC	Petroleum Geology	3	0	0	3
3	PCC	Fluid Mechanics for Petroleum Engineers	3	0	0	3
4	PCC	Heat Transfer Operations	3	0	0	3
5	PCC	Material and Energy Balances	3	0	0	3
6	PCC	Petroleum Geology-Laboratory	0	0	3	1.5
7	PCC	Fluid Mechanics for Petroleum Engineers-Laboratory	0	0	3	1.5
8	PCC	Heat Transfer Operations- Laboratory	0	0	3	1.5
9	SC	Python Programming	1	0	2	2
10	MC	Environmental Science	2	0	0	0
Total credits						21.5

II Year – II SEMESTER

S. No	Category	Course Title	Hours per week			Credits
			L	T	P	
1	HS	Management and Organizational Behaviour	3	0	0	3
2	BS	Mathematics –IV	3	0	0	3
3	PCC	Instrumentation, Process Dynamics & Control	3	0	0	3
4	PCC	Thermodynamics for Petroleum Engineers	3	0	0	3
5	PCC	Drilling & Well Completions	3	0	0	3
6	PCC	Instrumentation, Process Dynamics & Control -Laboratory	0	0	3	1.5
7	PCC	Mathematical methods for Petroleum Engineers –Laboratory	0	0	3	1.5
8	PCC	Drilling Fluids - Laboratory	0	0	3	1.5
9	SC	Industry Exploration Project	1	0	2	2
Internship 2 Months (Mandatory) during summer vacation						
Total credits						21.5
Honors/Minor courses (The hours distribution can be 3-0-2 or 3-1-0 also)			4	0	0	4



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III Year – I SEMESTER

S. No	Category	Course Title	Hours per week			Credits
			L	T	P	
1	PCC	Petroleum Exploration	3	0	0	3
2	PCC	Well Logging & Formation Evaluation	3	0	0	3
3	PCC	Petroleum Reservoir Engineering-I	3	0	0	3
4	OEC	Open Elective Course(for other branches) i. Introduction to Petroleum Engineering ii. Safety in Petroleum Operations iii. Corrosion Control in Petroleum Industry	3	0	0	3
5	PEC	Professional Elective courses i. Fundamentals of Liquefied Natural Gas. ii. CBM Reservoir Engineering iii. Offshore Drilling	3	0	0	3
6	PCC	Petroleum Reservoir Engineering -Laboratory	0	0	3	1.5
7	PCC	Drilling Simulation – Laboratory	0	0	3	1.5
8	SC	Soft Computing Techniques	1	0	2	2
9	MC	Essence of Indian Traditional Knowledge	2	0	0	0
Summer Internship 2 Months (Mandatory) after second year (to be evaluated during V semester)						1.5
Total credits						21.5
Honors/Minor courses (The hours distribution can be 3-0-2 or 3-1-0 also)			4	0	0	4



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III Year – II SEMESTER

S. No	Category	Course Title	Hours perweek			Credits
			L	T	P	
1	PCC	Petroleum Production Engineering	3	1	0	3
2	PCC	Petroleum Reservoir Engineering-II	3	0	0	3
3	PCC	Petroleum Refinery & Petrochemical Engineering	3	0	0	3
4	PEC	Professional Elective courses i. Advanced Well Completion Engineering ii. Applied Mathematics in Reservoir Engineering iii. Natural Gas Hydrates	3	0	0	3
5	OEC	Open Elective Course (for other branches) i. Basic concepts in Petroleum Drilling and Completions ii. Basic concepts in Petroleum Production Engineering iii. Basic concepts in Petroleum Reservoir Engineering	3	0	0	3
6	PCC	Petroleum Analysis-Laboratory	0	0	3	1.5
7	PCC	Petroleum Equipment Design & Simulation - Laboratory	0	0	3	1.5
8	PCC	Petroleum Reservoir Simulation-Laboratory	0	0	3	1.5
9	SC	Data Science	1	0	2	2
10	MC	IPR & Patents	2	0	0	0
Summer Internship 2 Months (Mandatory) after III year (to be evaluated during IV Year I semester)						
Total credits						21.5
Honors/Minor courses (The hours distribution can be 3-0-2 or 3-1-0 also)			4	0	0	4



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IV Year – I SEMESTER

S. No	Category	Course Title	Hours per week			Credits
			L	T	P	
1	PEC	Professional Elective courses i. Design of Surface Facilities ii. Reservoir Modeling & Simulation iii. Subsea Engineering	3	1	0	3
2	PEC	Professional Elective courses i. HSE in Petroleum Industry ii. Well Stimulation iii. Horizontal Well Technology	3	0	0	3
3	PEC	Professional Elective courses i. Petroleum Economics, Policies and Regulations ii. EOR Techniques iii. Asset Management	3	0	0	3
4	OEC	Open Elective Courses(for other branches) i. Transportation of oil and gas ii. Basics concepts in Seismic methods for Hydrocarbon Exploration iii. Basic concepts in Artificial lift methods	3	0	0	3
5	OEC	Open Elective Courses (for other branches) i. Deep water Technology ii. Basic concepts of acidizing and hydro-fracturing iii. Fundamentals of EOR Techniques	3	0	0	3
6		Universal Human Values 2: Understanding Harmony	0	0	3	1.5
7		Cloud Computing	0	0	3	1.5
Industrial/Research Internship after third year (to be evaluated during VII semester)						3
Total credits						23
Honors/Minor courses (The hours distribution can be 3-0-2 or 3-1-0 also)			4	0	0	4



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IV Year – II SEMESTER

Sl. No.	Category	Code	Course Title	Hours per week			Credits
1	Major Project	PROJ	Project (internship in industry)/ Project (in-house) and seminar.	0	0	0	12
INTERNSHIP (6 MONTHS)							
Total credits							12



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Suggested course list for B. Tech Minor Degree in Petroleum Engineering, 2022

S No	Course Name
1	Petroleum Geology
2	Petroleum Exploration
3	Well Logging & Formation Evaluation
4	Drilling & Well Completions
5	Petroleum Production Engineering
6	Petroleum Reservoir Engineering
7	Surface Production Operations
8	EOR Techniques
9	Unconventional Petroleum Sources
10	HSE in Petroleum Industry

NOTE: The above courses will be handled by the department, as these are not available from the list of NPTEL / SWAYAM portal.



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Suggested course list (Department/NPTEL/SWAYAM)-2022 for UG R20 regulation for Honors degree in Petroleum Engineering.

Department of PE & PCE**	
S. No	Course Name
1	General geology
2	Drilling fluids and cements
3	Well Testing
4	Advanced reservoir engineering
5	Statistics for petroleum engineers and geoscientists
6	Natural Gas Processing
7	Production optimization using nodal analysis
8	Shale gas engineering
9	Advanced natural gas engineering
10	Reservoir simulation

NPTEL/SWAYAM Portal	
S.No.	Course Name
1	Advanced thermodynamics
2	Environmental quality monitoring and analysis
3	Offshore structures under special environmental loads including fire resistance
4	Natural Gas Engineering
5	Upstream Liquefied natural gas technology
6	Computer methods of structural analysis of offshore structures
7	HSE practices for offshore structures and petroleum industries
8	Air pollution and Control
9	Flow through porous media
10	Project management and decision analysis

**These courses will be handled by the department of PE & PCE, if no courses are available for Petroleum Engineering in the NPTEL/SWAYAM portal.