

# BACHELOR OF TECHNOLOGY DEGREE PROGRAM IN PETROLEUM ENGINEERING

## B.TECH. (PETROLEUM ENGINEERING) 2018 - 2022

### 1.1 PROGRAM CURRICULUM

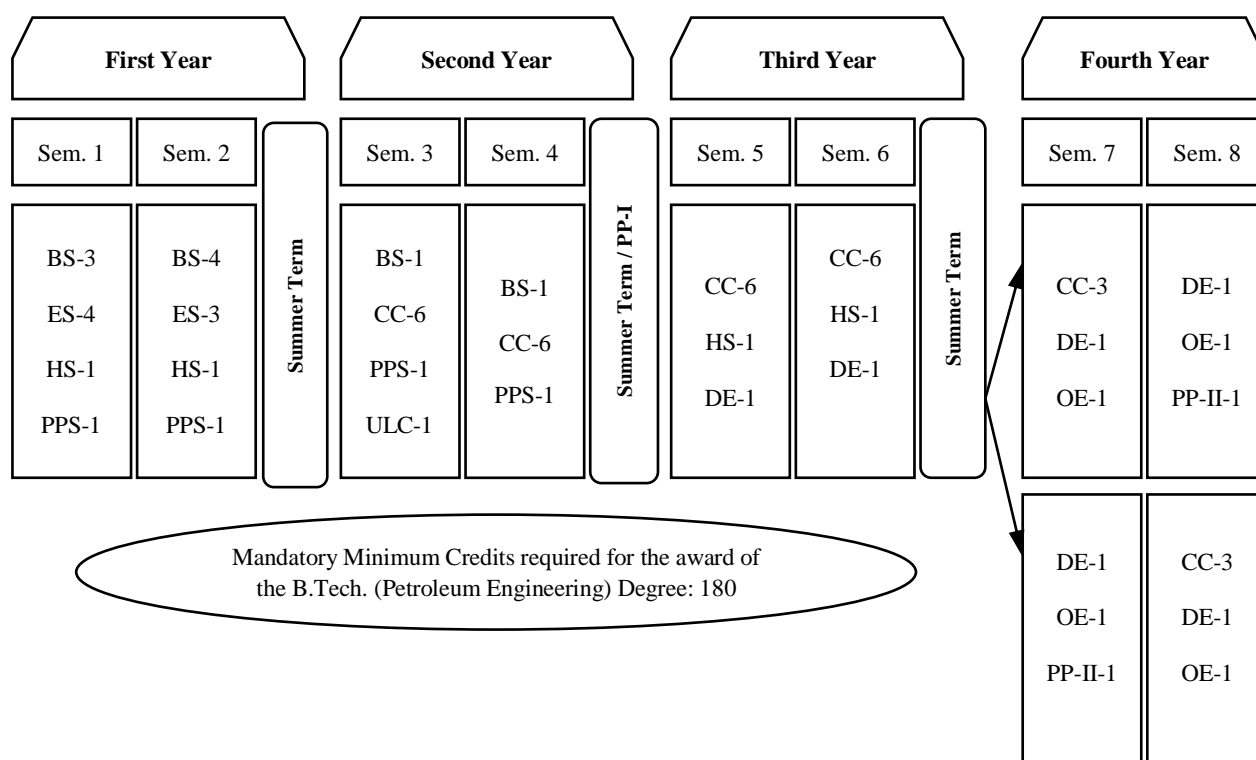
#### 1.1.1 Mandatory Courses and Credits

The B.Tech. (Petroleum Engineering) Program structure (2018-2022) consists of 60 courses totalling 180 credits.

Table 3.1.1 summarizes the type of courses, number of courses under each type and the associated credits that are mandatorily required for the completion of the Degree.

S. No.	Type of Courses	No. of Courses	Credits
1	Humanities, Social Sciences and Management Sciences (HS)	4	11
2	Basic Sciences (BS)	9	29
3	Engineering Sciences (ES)	7	21
4	Core (Professional ) Course (CC)	27	76
5	Discipline (Professional) Elective (DE)	4	12
6	Open Elective (OE)	2	6
7	Professional Practice (PP)	2	20
8	Personal and Professional Skills (PPS)	4	4
9	University Learning Courses (ULC)	1	1
<b>TOTAL</b>		<b>60</b>	<b>180</b>
<b>The mandatory minimum credits required for the award of the B.Tech. (Petroleum Engineering) Degree is 180 Credits.</b>			

1.1.2 B.Tech. (Petroleum Engineering) Program, Year-wise Structure



**Nomenclature:**

- BS - Basic Sciences
- ES - Engineering Sciences
- HS - Humanities, Social Sciences and Management Sciences
- PPS – Personal and Professional Skills
- CC - Core (Professional) Course
- ULC - University Learning Course
- PP - Professional Practice
- DE – Discipline (Professional) Electives
- OE - Open Electives

In the entire Program, the practical and skill based course component contribute to an extent of approximately 30% out of the total credits of 180 for B.Tech. (Petroleum Engineering) program of four years duration.

## 1.2 PROGRAM STRUCTURE

I SEMESHER - PHYSICS CYCLE (Aug-Dec)*						
S. No.	COURSE CODE	COURSE NAME	CREDIT STRUCTURE			
			L	T	P	CREDITS
1	MAT 101	Engineering Mathematics – I	3	1	0	4
2	PHY 101	Engineering Physics	4	0	0	4
3	EEE 101	Elements of Electrical Engineering	3	0	0	3
4	CIV 101	Elements of Civil Engineering	3	0	0	3
5	MEC 152	Engineering Graphics	2	0	4	4
6	ENG 103	Technical written communication	2	1	0	3
7	PHY 151	Engineering Physics Lab	0	0	2	1
8	MEC 151	Workshop Practice	0	0	2	1
9	PPS 105	Building Self Confidence	0	0	2	1
<b>TOTAL</b>			<b>17</b>	<b>2</b>	<b>10</b>	<b>24</b>

I SEMESHER - CHEMISTRY CYCLE (Aug-Dec)#						
S. No.	COURSE CODE	COURSE NAME	CREDIT STRUCTURE			
			L	T	P	CREDITS
1	MAT 101	Engineering Mathematics – I	3	1	0	4
2	CHE 101	Engineering Chemistry	4	0	0	4
3	ECE 101	Elements of Electronics Engineering	3	0	0	3
4	MEC 101	Elements of Mechanical Engineering	3	0	0	3
5	CIV 102	Environmental Science and Disaster Management	3	0	0	3
6	ENG 104	Technical spoken communication	1	0	2	2
7	CSE 151	Computer Programming	2	0	4	4
8	CHE 151	Engineering Chemistry Lab	0	0	2	1
9	PPS 105	Building Self Confidence	0	0	2	1
<b>TOTAL</b>			<b>19</b>	<b>1</b>	<b>10</b>	<b>25</b>

II SEMESHER - CHEMISTRY CYCLE (Jan-May)*						
S. No.	COURSE CODE	COURSE NAME	CREDIT STRUCTURE			
			L	T	P	CREDITS
1	MAT 102	Engineering Mathematics – II	3	1	0	4
2	CHE 101	Engineering Chemistry	4	0	0	4
3	ECE 101	Elements of Electronics Engineering	3	0	0	3
4	MEC 101	Elements of Mechanical Engineering	3	0	0	3
5	CIV 102	Environmental Science and Disaster Management	3	0	0	3
6	ENG 104	Technical spoken communication	1	0	2	2
7	CSE 151	Computer Programming	2	0	4	4
8	CHE 151	Engineering Chemistry Lab	0	0	2	1
9	PPS 106	Effective Communication	0	0	2	1
<b>TOTAL</b>			<b>19</b>	<b>1</b>	<b>10</b>	<b>25</b>

II SEMESHER - PHYSICS CYCLE (Jan-May)#						
S. No.	COURSE CODE	COURSE NAME	CREDIT STRUCTURE			
			L	T	P	CREDITS
1	MAT 102	Engineering Mathematics –II	3	1	0	4
2	PHY 101	Engineering Physics	4	0	0	4
3	EEE 101	Elements of Electrical Engineering	3	0	0	3
4	CIV 101	Elements of Civil Engineering	3	0	0	3
5	MEC 152	Engineering Graphics	2	0	4	4
6	ENG 103	Technical Written Communication	2	1	0	3
7	PHY 151	Engineering Physics Lab	0	0	2	1
8	MEC 151	Workshop Practice	0	0	2	1
9	PPS 106	Effective Communication	0	0	2	1
<b>TOTAL</b>			<b>17</b>	<b>2</b>	<b>10</b>	<b>24</b>

**Note: At the end of the 1<sup>st</sup> year (Common to all B.Tech. Program) the total credits offered is 49.**

The 1<sup>st</sup> year B.Tech. Program structure is executed in two cycles.

\* The students undergoing the “Physics” cycle shall take the courses as indicated.

#The students undergoing the “Chemistry” cycle shall take the courses as indicated.

III SEMESTER						
S. No.	COURSE CODE	COURSE NAME	CREDIT STRUCTURE			
			L	T	P	CREDITS
1	MAT 103	Engineering Mathematics - III	3	1	0	4
2	PET 218	Petroleum Geology	4	0	0	4
3	PET 219	Hydrocarbon Exploration	4	0	0	4
4	PET 220	Hydrocarbon Thermodynamics	3	1	0	4
5	PET 221	Drilling Fluids and Cements	3	0	0	3
6	PET 260	Petroleum Geology Lab	0	0	2	1
7	PET 254	Drilling Fluids and Cements Lab	0	0	2	1
8	PPS 107	Design Thinking and Team Building	0	0	2	1
9	ULC 101	University Learning Course*				1
<b>TOTAL</b>			<b>17</b>	<b>2</b>	<b>6</b>	<b>22 / 23</b>

\* Student has to register for University Learning Course in any one semester 3 / 4 / 6 to earn the mandatory credits.

IV SEMESTER						
S. No.	COURSE CODE	COURSE NAME	CREDIT STRUCTURE			
			L	T	P	CREDITS
1	MAT 105	Numerical Methods	3	1	0	4
2	PET 210	Well Logging and Formation Evaluation	3	1	0	4
3	PET 222	Heat, Mass and Momentum Transfer	3	1	0	4
4	PET 223	Fundamentals of Drilling Engineering	3	1	0	4
5	PET 224	Fundamentals of Reservoir Engineering	3	1	0	4
6	PET 253	Heat and Mass Transfer Lab	0	0	2	1
7	PET 255	Reservoir Engineering Lab	0	0	2	1
8	PPS 108	Being Corporate Ready	0	0	2	1
9	ULC 101	University Learning Course *				1
<b>TOTAL</b>			<b>15</b>	<b>5</b>	<b>6</b>	<b>23 / 24</b>

\*\*\*Note: Students will undergo Professional Practice – I during the summer break between the 4<sup>th</sup> and 5<sup>th</sup> semesters and the credits earned will be accounted for in the 5<sup>th</sup> semester.

V SEMESTER						
S. No.	COURSE CODE	COURSE NAME	CREDIT STRUCTURE			
			L	T	P	CREDITS
1	PET 213	Petroleum Production Engineering	3	1	0	4
2	PET 225	Advanced Reservoir Engineering	3	1	0	4
3	PET 226	Process Control and Instrumentation	3	1	0	4
4	PET 3XX	Discipline Elective - I	3	0	0	3
5	MGT 112 / MGT 113	Engineering Economics / Digital Entrepreneurship	3	0	0	3
6	PET 258	Reservoir Simulation and Modelling Lab	0	0	2	1
7	PET 261	Process Control Lab	0	0	2	1
8	PET 262	Momentum Transfer Lab	0	0	2	1
9	PIP 101	Professional Practice – I***				5
<b>TOTAL</b>			<b>15</b>	<b>3</b>	<b>6</b>	<b>26</b>

VI SEMESTER						
S. No.	COURSE CODE	COURSE NAME	CREDIT STRUCTURE			
			L	T	P	CREDITS
1	PET 214	Surface Production Operations	3	0	0	3
2	PET 215	Natural Gas Engineering	3	1	0	4
3	PET 227	Well Test Analysis	3	0	0	3
4	PET 228	Work over and Stimulation	3	0	0	3
5	PET 229	Offshore Drilling and Production	3	0	0	3
6	PET 3XX	Discipline Elective - II	3	0	0	3
7	MGT 113 / MGT 112	Digital Entrepreneurship / Engineering Economics	3	0	0	3
8	PET 259	Oil and Gas Processing Plant Design Lab	0	0	2	1
9	ULC 101	University Learning Course*				1
<b>TOTAL</b>			<b>21</b>	<b>1</b>	<b>2</b>	<b>23 / 24</b>

S. No.	COURSE CODE	COURSE NAME	CREDIT STRUCTURE			
			L	T	P	CREDITS
1	PET 216	Enhanced Oil Recovery	3	1	0	4
2	PET 217	Petroleum Refining and Petrochemicals	4	0	0	4
3	PET 3XX	Discipline Elective – III	3	0	0	3
4	PET 4XX	Open Elective – I	3	0	0	3
5	PET 256	Petroleum Testing Lab	0	0	2	1
<b>TOTAL</b>			<b>13</b>	<b>1</b>	<b>2</b>	<b>15</b>

VIII SEMESTER						
S. No.	COURSE CODE	COURSE NAME	CREDIT STRUCTURE			
			L	T	P	CREDITS
1	PET 3XX	Discipline Elective – IV	3	0	0	3
2	PET 4XX	Open Elective – II	3	0	0	3
3	PIP 102	Professional Practice– II				15
<b>TOTAL</b>			<b>6</b>	<b>0</b>	<b>0</b>	<b>21</b>

S. No.	COURSE CODE	COURSE NAME	CREDIT STRUCTURE			
			L	T	P	CREDITS
1	PET 301	Well Design and Construction	3	0	0	3
2	PET 303	Pipeline Engineering	3	0	0	3
3	PET 304	Reservoir Geomechanics	3	0	0	3
4	PET 306	Transport Phenomena	3	0	0	3
5	PET 308	Health, Safety and Environment	3	0	0	3
6	PET 316	Fundamentals of Process Engineering Calculations	3	0	0	3
7	PET 317	Advanced Drilling Engineering	3	0	0	3
8	PET 318	Unconventional Hydrocarbons	3	0	0	3
9	PET 319	Oil Field Development and Reservoir Management	3	0	0	3
10	PET 320	Remote Sensing and GIS	3	0	0	3

S. No.	COURSE CODE	COURSE NAME	CREDIT STRUCTURE			
			L	T	P	CREDITS
1	CIV 401	Geographical Information Systems	3	0	0	3
2	CIV 402	Environmental Impact Assessment	3	0	0	3
3	CIV 403	Sustainable Materials and Green Buildings	3	0	0	3
4	CIV 404	Construction Project Management	3	0	0	3

Open Elective Courses offered by Department of Computer Science and Engineering, SOE						
1	CSE 401	Image Processing	3	0	0	3
2	CSE 402	Data Structures Using C	3	0	0	3
3	CSE 403	Software Testing and Quality Assurance	3	0	0	3
4	CSE 404	Social Network Analytics	3	0	0	3
5	CSE 405	Digital and Mobile Forensics	3	0	0	3
6	CSE 406	Database Management Systems	3	0	0	3
7	CSE 407	Multimedia and Animation	3	0	3	3

<b>Open Elective Courses offered by Department of Electrical and Electronics Engineering, SOE</b>						
1	EEE 401	Artificial Neural Networks	3	0	0	3
2	EEE 405	Energy Audit	3	0	0	3
3	EEE 406	Research Methodology	3	0	0	3
4	EEE 407	Smart Grid Technology	3	0	0	3
5	EEE 408	Professional Ethics in Engineering	3	0	0	3
<b>Open Elective Courses offered by Department of Electronics and Communication Engineering, SOE</b>						
1	ECE 401	Artificial Neural Networks	3	0	0	3
2	ECE 402	Biomedical Instrumentation	3	0	0	3
3	ECE 407	Internet of Things	3	0	0	3
4	ECE 408	Industrial Automation and Control	3	0	0	3
<b>Open Elective Courses offered by Department of Mechanical Engineering, SOE</b>						
1	MEC 401	Automotive Vehicles	3	0	0	3
2	MEC 402	Nanotechnology	3	0	0	3
3	MEC 405	Engineering Optimisation	3	0	0	3
4	MEC 406	Operations Research for Engineers	3	0	0	3
5	MEC 407	Operations Management	3	0	0	3
6	MEC 408	Work Study	3	0	0	3
7	MEC 409	Project Management	3	0	0	3
8	MEC 410	Organizational Behaviour	3	0	0	3
9	MEC 411	Renewable Energy Systems	3	0	0	3
<b>Open Elective Courses offered by Department of Petroleum Engineering, SOE</b>						
1	PET 402	Computational Methods in Chemical Engineering	3	0	0	3
2	PET 403	Computational Fluid Dynamics	3	0	0	3
3	PET 405	Petroleum Corrosion Technology	3	0	0	3
4	PET 406	Polymer Technology	3	0	0	3
5	PET 407	Total Quality Management	3	0	0	3
6	PET 408	Oil and Gas Marketing and Resource Management	3	0	0	3
1	PSY401	Social Psychology	3	0	0	3
2	ENG401	Literature Appreciation	3	0	0	3
3	CHE 401	Composite Materials	3	0	0	3
4	CHE 402	Catalysis Technology	3	0	0	3