Introduction to Petroleum Technology

1.1 Course Number: PE201

1.2 Contact Hours: 3-0-0 Credits: 9

1.3 Semester-offered: 2nd Year-Odd

1.4 Prerequisite: None

1.5 Syllabus Committee Member:

2. **Objective:** The intent of this course is to give an overview of oil and gas sector to Petroleum Technology students in their BTech program and motivate them. This course is to have lectures incorporating all aspects of petroleum technology.

3. **Course Content:**

Unit-wise distribution of content and number of lectures

Unit	Topic	SubTopics	Lectures
1	Overview of Oil and Gas Industry	Petroleum Industry – Upstream, Downstream, Midstream Demand and Supply of oil and gas; Refining and Petroleum Products, Unconventional sources of energy	2
2	Petrolem Geology	Nature of Petroleum – composition & properties. Concepts of Petroleum Geology & Basic Rock Properties – source , migration & accumulation of petroleum. Porosity, permeability and rock pressure concepts of rocks. Coring Needs - Coring methods and core analysis. Petroliferous basins of India	8
3	Exploration Techniques and Well Logging	Geological and Geophysical exploration methods. Concepts of Well Logging & Formation Evaluation Techniques – Drill Stem Testing (DST)	7
4	Drilling Technology	Well Planning, Wellbore Pressures, GTO, Drilling Rigs, Drilling tools and equipment, Concept of drilling fluids their composition and properties. Casing and Cementing Practices.	7

5	Reservoir Engineering	Reservoir rock and fluid properties, Reservoir drive mechanisms, Fluid flow through porous media, Reserve Estimation methods, EOR/IOR Techniques	**8**
6	Production Operation	Concept of Oil Production, gathering, treatment, Storage, Testing and Transportation.	**8**
		Total	**40**

4. Readings

4.1 Textbook:

1. Hyne, N.J., Nontechnical Guide to Petroleum Geology, Exploration, Drilling & Production, PennWell
2. Leffler, W.L., Petroleum Refining in Non-technical language, PennWell
3. Fundamental of Reservoir Engineering, L.P. Dake.
4. Reservoir Engineering Handbook, Tarek Ahmed
5. Petroleum Engineering Drilling & Well completion by Carl Gatlin.

4.2 Reference books:

1. Jahn, Cook, and Graham, Hydrocarbon Exploration and Production, Elsevier
2. Palmer, A. 2016, Introduction to Petroleum Exploration and Engineering, World Scientific
3. Articles and videos from the American Association of Petroleum Geologists
4. Articles and videos from the Society of Exploration Geophysicists
5. Articles and videos from the Society of Petroleum Engineers

5 Outcome of the Course:

- Know the oil and gas sector
- Know how oil and gas well is drilled and produced
- Understand the hydrocarbon value chain
- Know the properties of oil and gas reservoir
- Understand energy demand and supply scenario