

Petroleum Engineering

What is engineering?

Engineering is the application of mathematics, science, economics, and social and practical knowledge to invent, innovate, design, build, maintain, research, and improve structures, machines, tools, systems, components, materials, processes, solutions, and organizations.

It is an application of scientific knowledge to solve, problems in the real world. The Engineers are problem solvers, organizers, communicators and designers. Engineers apply the principles of science and mathematics to develop economical solutions to technical problems. Their work is the link between scientific discoveries and the commercial applications that meet societal and consumer needs. Many engineers develop new products. In the present era, engineers need to understand computing programs along with domain knowledge. Engineering profession is becoming increasingly interdisciplinary; making demands on knowledge, skills as well as personality. Our B. Tech. Program is based on three cardinal principles: **providing social context to education, giving maximum choice to the student to choose a career path, encouraging experiential learning.**

What is Petroleum Engineering?

Petroleum Engineering is a field of engineering concerned with the activities related to the production of hydrocarbons, which can be either crude oil or natural gas. Exploration and Production are deemed to fall within the upstream sector of the oil and gas industry. Petroleum Exploration, by earth scientists, and essential engineering for Production of hydrocarbons by Petroleum Engineering are the oil and gas industry's two main subsurface disciplines, which focus on maximizing economic recovery of hydrocarbons from subsurface reservoirs.

Petroleum Geology and Geophysics focus on provision of a static description of the hydrocarbon reservoir rock, while Petroleum Engineering focuses on estimation of the recoverable volume of this resource using a detailed understanding of the physical, chemical behaviour of oil, water and gas within porous rock which may be at very high depth, pressure and temperature conditions. The combined efforts of geologists and petroleum engineers throughout the life of a hydrocarbon accumulation determine the way in which a reservoir is developed, drilled and produced. Usually these phases have the highest impact on field economics.

Petroleum Engineering requires a good knowledge of many other interrelated disciplines, such as

geophysics, petroleum geology, formation evaluation (well logging), drilling, well engineering, completion engineering, reservoir engineering, reservoir simulation, petroleum production engineering, artificial lift systems, enhanced oil recovery techniques, transportation of crude oil, natural gas and their derived products at onshore or from offshore to onshore and economics.

Petroleum Engineering Programme at MIT-WPU



At MITWPU, in the Department of Petroleum Engineering, we impart detailed understanding of geosciences, implement beyond

conventional-innovative learning techniques and deliver technologically complex methods to students with the help of industry to extract the petroleum resources efficiently. We have an educational environment to take up technology intensive research projects at UG, PG, Ph. D., and also at collaborative levels to advance new hydrocarbon volumes into country's energy basket.

The integrated educational model of four years graduation course, 'B. Tech. in (Petroleum)', of our department is India's second oldest and innovative programme. More than thousand students have graduated from this program since 1983, are working in oil and gas industry all over the globe holding senior positions and contributing significantly to the petroleum industry. The strong alumni network is our most important connection to the corporate world when it comes to placements and interaction with the industry.

Our curriculum is based on the competency matrix of Society of Petroleum Engineers, SPE International and designed to equip the student with the fundamentals necessary to achieve the lifelong professional development. It is accredited by National Board of Accreditation, Government of India in 2003, 2008 and 2015.

Presence of CAIRN CAMPUS CONNECT, ONGC Chair Professors and MoU with SHELL and AKER SOLUTIONS are few important milestones in the history of the department. We have taken an initiative to develop a state-of-the-art, "Subsea Engineering Laboratory", with support from AKER Powergas Subsea Private Limited on the campus of our University.

We have extremely good infrastructure and experienced, competent and qualified faculty members and proprietary software used by the oil and gas industry to conduct the broad based curriculum. Field visits are also arranged to explain the concepts of sedimentary basins in addition to industrial field familiarization program for the benefit of students. Students are also deputed to four to six week's summer or winter internships to understand the working environment of the petroleum industry.

The MIT-SPE student chapter, established in 1989, is one of the most active chapters in the world. Annual Industry Institute Interaction Programme and number of other student centric activities that are organized throughout the year by the MIT-SPE Student Chapter and the Petroleum Department, provides an ideal platform for students to interact with professionals from oil and gas industry. This has helped us to attain the status of Outstanding Student Chapter Award from SPE International in the years 2014 and 2015, after having received Gold Student Chapter Award in earlier years.

Program Objectives

The B. Tech. Petroleum Engineering program under MIT-WPU is a 4 year, 12 trimester, choice based credit system pattern program.

Objectives:

- ✓ To provide excellent and effective teaching and design experiences for graduates to enter the practice of petroleum engineering and pursue lifelong professional development.
- ✓ To provide world-class undergraduate petroleum engineering curriculum comprising of foundation, core, electives and unique courses related to sustainable development, leading to World Peace.
- ✓ To develop competency in students in broad areas of Petroleum Engineering through quality teaching, internship and industrial exposure.
- ✓ To train and develop professionals with a holistic approach, who can work at global level in a diversified cultural environment.

Salient Features

- ✓ Teaching learning method based on student's active participation in his/her own learning (Active Learning Pedagogy).
- ✓ Emphasis on social responsibility of an engineering profession (Professional Education with Social Context).
- ✓ Flexibility in choice of subjects leading to a definite career path.

- ✓ Value based education.
- ✓ Creatively designed curriculum providing for experimental learning through real life problem solving in association with industry.
- ✓ Multicultural and international exposure to prepare the students for a global career.

In this Program, You will learn....

First Year of engineering provides foundation of basic and engineering sciences including living systems. Since design is an activity central to the engineering profession, students in first year are given perception and exposure to design thinking. Social internship in first year is credit based and exposes the students to the problems faced by community. This is expected to sow the seeds of socially oriented innovation in the student's mind.

Second Year courses are designed to provide strong foundation in engineering sciences from chosen disciplines. Summer internship at the end of second year involves a guided study tour. The tour will expose the students to our diverse culture, technology, achievements and challenges.

Third and Fourth Years will include core subjects belonging to petroleum engineering and will also include subjects belonging to the chosen track in his/her own trade. Such courses will cover from basics to in-depth knowledge of petroleum engineering. International study tour of four weeks duration will offer global exposure. Project based learning in the last two trimesters will inculcate problem solving skills, team spirit, use of inter-disciplinary ideas, professional ethics and habit of self-learning.

How will this Program be taught?

Number of Years	Four (Trimester Pattern)
Number of Semester	Twelve.
Evaluation Pattern	Continuous Evaluation and End-semester Examination along with Practical and Oral Examinations.
Electives	Choice based Electives to follow specialization tracks.
Internship and projects	Four to eight weeks internship. Projects based on various disciplines of petroleum engineering and industrial/research oriented problems.
Value Added Certification	Social internship, world peace and philosophy certification, international modular certification jointly with a reputed organization

The petroleum engineering students will provide a broad education spectrum from exploration of hydrocarbons to refining and transportation of oil and gas. This will involve understanding of knowledge of pure and applied sciences along with different engineering clusters related to petroleum industry. They are given exposure to learn the safest and most efficient methods of bringing hydrocarbon resources to the surface. At MIT-WPU, we

develop Petroleum Engineers with sound human values and sense of world citizenship. Our objective is to offer students with real life industrial exposure. National and international study tours will provide global exposure to our students. Our program includes main clusters such as exploration, drilling engineering, production engineering, reservoir engineering, refining and transport of oil and gas. The curriculum is imparted with active learning methods like problem based learning (PBL), experiential learning and collaborative learning. Choice based course selection, projects and electives across disciplines offer much needed inter-disciplinary approach to budding petroleum engineers. Equipped with highly experienced faculty and strong industry academia connect, MIT WPU Petroleum Engineering Program offers to turn out world class Petroleum Engineers.

Programme Structure

- Blending of latest industry trends with fundamental knowledge base in Petroleum Engineering.
- According to the structure and syllabi the contents are categorized as,
 - BS : Basic Sciences
 - EC : Engineering Core
 - DC : Departmental Core
 - DE : Departmental Electives
 - HS : Humanities and World Peace
 - SK : Skill based Courses

Majors (Tracks)

- **B. Tech. Petroleum Engineering Program**
 - ✓ Exploration, risk and decision analysis
 - ✓ Reservoir Engineering
 - ✓ Drilling Engineering
 - ✓ Production Engineering
 - ✓ Refining and transport
 - ✓ Environmental Engineering
 - ✓ Data analytics in Petroleum Engineering
 - ✓ Logistics and Supply Chain Management

A Specimen Day Schedule includes

- Technology Courses: Theory, Laboratories and Practice
- Research, Explorations and Collaborations
- Experiential Learning : Projects, Assignments and other activities

- World Peace Courses: Yoga, Sports, Ethos, Ethics, Liberal Arts and Life Skills

MIT-WPU Method for Academics

- ✓ A revolutionary education system that is completely flexible and continuously updated while interacting with surroundings.
- ✓ Contemplates on the future requirements of students while focusing on the inclusion of those traits in current students in real time.

Live Projects

- ✓ Live Project at National level.
- ✓ Community based learning experience at rural areas to understand the problems and provide solutions.
- ✓ Opportunity to work on interdisciplinary projects.

Industry Internship

- ✓ Industry Internship/Research Project at national level.
- ✓ Modular training/certification programs with reputed organization/university.

Advisors and Speakers:

- Dr. Shirish Patil, Saudi Aramco Chair Professor, Petroleum Engineering Department, College of Petroleum Engineering and Geosciences , King Fahd University of Petroleum and Minerals, Dhahran, Saudi Arabia
- Dr. Rajendra V. Marathe, Ex. Executive Director, ONGC, Mumbai
- Dr. T. Kumar, Professor, Department of Petroleum Engineering, IIT (ISM) Dhanbad, and Ex-Director, NIT Durgapur
- Dr. Akhil Datta-Gupta, Professor, Department of Petroleum Engineering, Texas A & M, USA
- Dr. G. P. Karmakar, Professor in Petroleum Engineering, Department of Mining Engineering, IIT Kharagpur, India
- Dr. Abhijit Dandekar, Professor, Department of Petroleum Engineering College of Engineering and Mines, University of Alaska Fairbanks, USA

Guides and Speakers:

- Shri S. K. Moitra, Director, Onshore, ONGC, India.
- Dr. Rakesh Kumar Vij, Ex. Executive Director- Asset Manager, Jorhat Asset, ONGC, India.

- Shri K. K. Roy, Associate Advisor, ONGC, Mumbai, India.
- Shri C. M. Venkat, Director, Subsea India, Aker Powergas Subsea Pvt. Ltd, Pune, India.
- Shri Yashodeep Deodhar, MD, 1Derrick, Bengaluru, India.
- Dr. Rahul Patil, Director, Halliburton Technology, Centre, Pune, India.
- Shri Arun Karle, President, Askara International Inc., Mumbai, India.
- Dr. Ramashish Rai, President and CEO, Raeon Energy Services, Navi Mumbai, India.
- Shri Madhukar Naik, MD, Aquachem Eniviro Engineers, Mumbai, India.

Distinguished Alumni:

- Shri Shudendu Kashikar, CEO, Reveal Energy, USA.
- Dr. Neeraj Nandurdikar, Director, Independent Project Analysis, USA.
- Dr. Suhas Bodhwadkar, Program Manager, Schlumberger, Kuwait.
- Shri Ameet Nivsarkar, Global Business Strategy and Corporate Affairs Professional, TCS, India.
- Shri Mandar Pathak, Regional Manager, Blade Energy, USA.
- Shri Abhimanyu Kohok, Director, Ardur Energy, UK.
- Shri Sumit Bhat, Senior Global Advisor-Global Operations, Halliburton, USA.
- Shri Shirish Limaye, Director Operations, Envolve-Integrated System, (Centene Corporation) USA.

Faculty

The faculty members in the Petroleum engineering program are well qualified, competent and experienced to cover all subjects in the curriculum. The faculty members are also available as mentor for career development.

Assessment

Evaluation pattern: Continuous evaluation, Midterm, End semester examination, Practical and or oral examination. Continuous assessment of work 50%, Mid-semester and End-semester examination 50 %.

Infrastructure:

College Infrastructure

Hostels	Spacious Rooms (AC/Non-AC), Laundry
Canteens	Wide range of meal options
Recreation facilities / Sports	Basketball Court, Gymnasium, Wrestling arena, Volley ball court, Athletics track
Classrooms	Equipped with audio-visual facilities, modern ICT facilities
Auditorium	Fully air-conditioned with around 800 seating capacity with excellent acoustics, used by students for performing arts and movie screening.

Employment Opportunities

Petroleum Engineering Graduates are prepared to join both the Exploration & Production and service companies or public and private sectors of the oil and gas industry or to pursue further education as per their interest in higher studies and research opportunities across the globe.

- ✓ Oil and gas exploration
- ✓ Petroleum production engineering
- ✓ Reservoir engineering
- ✓ Research and development in petroleum engineering
- ✓ Service companies
- ✓ Oil well drilling engineering
- ✓ Well logging services
- ✓ Petroleum economics
- ✓ Environmental management in Petroleum Engineering
- ✓ Entrepreneurship and consultancy
- ✓ Modeling and Simulation
- ✓ Petroleum refining and process engineering
- ✓ Health safety and environment
- ✓ Marketing of oil, gas and petroleum Products
- ✓ Offshore and subsea engineering
- ✓ Transportation of oil and gas
- ✓ Design of equipment
- ✓ Supply chain management and logistics
- ✓ Instrumentation and process control
- ✓ Data analytics in oil and gas

Industry affiliations



Life @ Department, Campus and events

Technical Competitions / Events arranged by Students /University:

Number of student centric activities and competitions are being organized in the Department of Petroleum Engineering, throughout the year. With the presence of ONGC Chair, MIT-SPE (Society of Petroleum Engineers), SPG (Society of Petroleum Geophysicists) student chapters, and support of various E & P and Service companies, Annual Industry Institute Interaction Program (AIIP) is organized every year. Key professionals of the oil and gas industry and Alumni of the Department are invited to interact with the students and faculty during these occasions.

NIRMITEE (Civil Engineering), TEXEPHYR (Mechanical, Computer, E&TC, IT), PETROVISION (Petrochemical), AFFINITY (Polymer) are the activities, that are being organized by other Department of Engineering.

Extra-curricular activities:

- ✓ Annual social gathering
- ✓ NCC
- ✓ Sports And Trekking
- ✓ Inspirational movie screening

- ✓ Heritage tours
- ✓ Visits to empower students in rural area

Co-curricular activities:

Continuous education programs awarding certificates, Technical competitions, Invited industry expert sessions, Faculty development programs. Workshops / Seminars organized on a regular basis, with the support of MoUs signed with leaders in the oil and gas industry like ONGC, Aker Solutions, Cairn and Emerson.

Events:

ROBOCON (International and national level competitions on Robotics), ONGC Chair programs to promote quality education Petroleum Engineering.

Program Intake

Intake 60 (Sixty)

Eligibility*

Eligibility 10 + 2 Science pattern, with Mathematics, Physics and Chemistry as compulsory subjects with minimum score of 60% and English as compulsory subject. Common valid Score of Entrance Test JEE, MH-CET Admissions.

Selection Criteria

Selection criteria Merit based. As per the norms laid down by Government of Maharashtra for the year 2017-18.

Application Form Fees:

Application Fee INR 1500/-

Glimpses of Student centric activities:



Shell outstanding student challenge award.



Winning team of ACE case study challenge, with their award by Cairn India



Workshop on work-life balance for Girl students



Interaction with Alumni



Students during model making and interaction with Industry Professionals



Interaction with Industry Professionals



**Publication of annual magazine
MITSPECK during AIIP**



**Visit of SPE President to MIT-SPE
Student Chapter**



**Participation in Annual Technical Meetings at
SPE Mumbai Section**



Interaction and special lecture session conducted by Shri. Vilas Tawde, Director & CEO, Essar Oil and Gas, Exploration and Production Ltd., for Petroleum Engineering students at MIT, Pune on 25th January 2018.

Glimpses of alumni meet at various places, across the globe:



1st Row from Left to right: Ram Jawale(2005), Sachin Wagh(2005), Prithvi Kesanani(2005), Fauzan A. Wane(2004), Rahul Kale(2005), Swapnil Bhamare(2007), Darshan Pingale(2005), Anas(2008), Arpit G. Nikesh shinde(2004), Rachit Garg(2008), Omkar Mukadam (2007), B. Kunchur(2009).
2nd Row from Left to right: Dipak Patil(2006), Niranjana Hiray(2001), Abhilash Nair(2005), Anand Nav. Altekar(2001), Pratul Rane(2006), Anil Kalbande(2005), Ashish Fadare(2006), Sricharan(2007).
3rd Row from Left to right: Sambhaji Devkar(2006), Arvind Birajdar(2008), Yogesh Takate(2005)

Alumni Meet in Kuwait on 22 January 2016



Alumni Meet at MIT Pune, India in March 2017



Reunion of Petroleum Alumni on Tuesday, October 10, 2017 during the Annual Technical Conference and Exhibition 2017 held in San Antonio, Texas, US.



Reunion of Petroleum Alumni on Sunday, October 8, 2017 in Abu Dhabi, UAE

Glimpses of Laboratory Demonstration:



Demonstration on working of a Drilling Rig



Demonstration on working of a PLC system

Reach Us @



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Alumni Testimonials

“I will never forget my time at the Petroleum Engineering department in Maharashtra Institute of Technology, and I look back on it fondly. When I started in the first year of college, I was not really sure what Petroleum engineering was all about but over the period of four years I realized that the experiences and enriching opportunities that the course offered were enormous. I was exposed to the basics of most aspects of the petroleum industry which helped me become an adaptable and thorough engineer in the field. The Petroleum Engineering department creates an incredibly supportive environment for engineers which I have not seen duplicated anywhere else!”

Rohan Vaishampayan (2001 Batch)

Leading Advisor

Statoil,

Stavanger, Norway

“I learnt crucial life skills both during and after graduation from the Petroleum Engineering Dept. at MIT from technical aspects required to set myself up for a research oriented career in oil and gas to exposing me to extra-curricular activities organized by student clubs on campus”

Panav Hulsurkar (2013 Batch)

MS- Petroleum, University of Alaska Fairbanks

PhD student at University of Wyoming, US