



**NATIONAL UNIVERSITY OF ENGINEERING
COLLEGE OF PETROLEUM AND PETROCHEMICAL ENGINEERING
PETROCHEMICAL ENGINEERING PROGRAM**

PP212 – TECHNOLOGY OF THE HYDROCARBON INDUSTRY

I. GENERAL INFORMATION

CODE	:	PP212 – Technology of the Hydrocarbon Industry
SEMESTER	:	4
CREDITS	:	3
HOURS PER WEEK	:	4 (2 Theory – 2 Practice)
PREREQUISITES	:	General Geology – PG211
CONDITION	:	Compulsory

II. COURSE DESCRIPTION

The course provides a general version of the technologies used in the different stages of the oil and gas industry. It explains the fundamentals of the various productive phases of these energy resources, from their extraction to commercialization. It will be understood its advantages and disadvantages from the economic, environmental point of view and its importance within the energy resources at national and international level.

III. COURSE OUTCOMES

The student:

1. He knows the oil history in Peru and in the world.
2. Understands and differentiates the different technologies used in the hydrocarbon industry.
3. It identifies the exploration, exploitation, transportation and refining phases of the hydrocarbon industry.
4. Recognizes the type of transport and storage of surface hydrocarbons.
5. Knows and differentiates the different physical and / or chemical processes to obtain final products.

IV. LEARNING UNITS

- 1. A BRIEF HISTORY OF THE OIL, GAS, REFINING AND PETROCHEMICAL INDUSTRY. INDUSTRIAL DEVELOPMENT / 2 HOURS**
Origin of oil / inorganic theory / organic theory / Nature of oil.
- 2. FAVORABLE GEOLOGICAL STRUCTURES. TYPES OF RESERVOIRS / 4 HOURS**
Sedimentary basins definition and formation / Types of reservoirs.
- 3. PHASES OF THE OIL AND GAS INDUSTRY / 8 HOURS**
Exploration / Exploitation (drilling and production) / Transportation / Storage / Transformation (refining and petrochemical).
- 4. EXPLORATION / 8 HOURS**
Surface Geology, Topographic Surveys, Geological Studies / Geophysical Exploration: Seismic, Gravimetric and Magnetic / Geochemical Exploration, Radioactive, Exploratory Drilling.
- 5. WELL DRILLING / 4 HOURS**
Percussion systems, rotating, directed and / or horizontal system.

6. PETROLEUM PRODUCTION / 6 HOURS

Natural gas / Liquid gas / Mechanical pump / Electric pump / Secondary recovery / Drilling fluids.

7. STORAGE AND TRANSPORTATION / 5 HOURS

Tanks for oil, gas and by-products / Transportation of oil and gas by pipelines, pipelines, pipelines, river and lake.

8. MANUFACTURE AND REFINING OF PETROLEUM AND GAS / 6 HOUR PRODUCTS

Atmospheric Distillation / Vacuum Distillation / Thermal Cracking / Catalytic Cracking / Pyrolysis / Reforming / Natural gas treatment and separation.

9. METHANE AND NORMAL PETROCHEMISTRY / 6 HOURS

Synthesis gas / Acetylene / CO, H₂ and NH₃ / Parafins, ethane propane, n-butane, naphtha / Production of alcohol Methyl: 1,3-butadiene, acetylene, etc.

10. INDUSTRIAL FACILITIES / 6 HOURS

Refineries / Petrochemical Plants / Industrial Waste Treatment / Environmental Protection / Industrial Waste Disposal Techniques.

V. LABORATORY AND PRACTICAL EXPERIENCES

There are 4 directed practices and 4 qualified practices.

VI. METHODOLOGY

The course is developed in sessions of theory and practice. In theory sessions, the teacher presents concepts, theorems and applications. In the practical sessions, various problems are solved and their solution is analyzed. At the end of the course the student must present and present an integrating project or project. In all the sessions the active participation of the student is promoted.

VII. GRADING FORMULA

The "G" evaluation system is used. Calculation the Final Average:

$$FA = (ME + FE + AP) / 3$$

MP: Mid-term Exam. FE: Final Exam.

AL: Average of Qualified Practices.

VIII. BIBLIOGRAPHY

1. **PETER K. LINK** Basic Petroleum Geology. Editorial Oil & Gas Consultants Intl, 1990.
2. **GARY AND HANDWERK** Refine of Oil, Technology and Economy. Editorial Reverté, 1980.