



«PETROLEUM GEOCHEMISTRY», 5 days

COURSE OBJECTIVE:

Development of professional competencies in sphere of hydrocarbon exploration, development and production including advanced study and systemization of knowledge about the generation, migration, accumulation and conservation of fluids, mode of its occurrence in the subsurface, which is essential for understanding of accumulation process, fluids content and its further commercial development.

ACQUIRED ABILITIES:

- Analyze databases of anthracides composition, reservoir rock properties and data processing;
- Figure oil and gas deposits;
- Apply knowledge of organic substance evolution;
- Define kerogen types through geochemical analysis;
- Summarize test reports and write performance reports.

COURSE CONTENT:

Module Name	Content
Introduction	Course objectives. Petroleum geology and geochemistry origin. Oil and gas exploration history. Anthracides role. Main oil and gas producing regions.
Oil and gas nature	Elementary, fractional, group and molecular composition of oil. Non-hydrocarbon oil compound. Biomarkers. Classification of oil. Content and physical properties of gases. Natural gas classification. Saturation pressure. Gas ratio. Gas-hydrates. Gas-condensate systems. Oil alteration products - crude bitumen. Concepts of oil origin.
Hydrocarbon source	Forms of carbon in the subsurface. Content of organic substance. Classification of sedimentary strata. Kerogen types. Oil potential.
Organic substance evolution	Biosphere. Living material content. Sedimentogenesis of organic substance. Diagenetic alterations. Katagenesis, and factors. Organic substance alteration. Maturation estimation methods. Rock-Eval analysis.
Fundamentals of hydrocarbon system elements	Natural reservoir, reservoir rock, oil source rock, fluid seal (seal rock), trap, deposit. Reservoir types. Porosity and permeability, measurement units and its types. Residual water saturation. Porosity and

	permeability dependence on mineral composition, grain shape and size, roundness and sorting, cement presence and composition.
Oil and gas migration	Migration types: primary and secondary. Migration factors. Directions and range of migration.
Oil and gas deposits, traps and fields	Deposits and traps typology. Fields, its classification. Time of fields' generation.
Petroleum basin	Definition of petroleum basin. History of sedimentary basin. Evolutionary tectonic classification. Elements of oil geological zoning. Oil accumulation flows.
Solid fossil fluids	Lignum fossile. Sapropel and sapropelites. Classification of coals. Coal stage of carbonification. Coal maceral.