



«ROCK PHYSICS FOR EFFECTIVE RESERVOIR PHYSICAL PROPERTIES MODELING», 3 days

COURSE OBJECTIVE:

improvement of professional competencies of engineers in sphere of Rock Physics as a mean for connection of rock composition and microscopic structure with its physical properties (elastic waves velocity, thermal and electrical conductivity, hydraulic permeability) for hydrocarbon reservoirs.

ACQUIRED ABILITIES:

- predict the physical properties of rocks at various scales according to composition and structural features;
- explain correlation between physical properties;
- define non-measurable features based on measurable ones;
- specify geometric characteristics of sedimentary rock porous-fractured space;
- identify fractured areas in reservoir rock and define its parameters;
- restore elastic tensor (or transport features) based on limited number of physical properties when traditional methodology cannot be applied;
- construct scale-dependent velocity model of anisotropic reservoir rock for hydraulic fracturing monitoring.

COURSE CONTENT:

Module Name	Content
Fundamentals of effective medium theory (EMT)	EMT for geophysics tasks. Effective physical properties. Geological materials as microscopically inhomogeneous and macroscopically anisotropic compound environment. Solutions for effective physical properties. Key methods of EMT. EMT testing at model environment and geological material. Multidisciplinary approach to the modeling of reservoir physical properties.
Rock Physics Practice	Direct and inverse tasks of EMT. Effective physical properties modeling. Case studies. Forecast of one-type properties through another type properties. Experimental and theoretical works for upscaling of physical properties.