Mechanics of oil and gas reservoirs

Kazan (Volga Region) Federal University

Degree or qualification is awarded: **Master**

Language of study: **Russian**
Mode of study: **full-time**
Duration: **2 years**
Availability of free education: **no**
Price: **168 960 RUB per year**

Programme webpage at the university website: https://kpfu.ru/math/admissions

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About the program

The goal of the program is the preparation of skilled, competitive specialists in the field of research and development. The program is focused on mathematical methods and computer technologies used to solve problems of oil and gas reservoir mechanics, in accordance with the needs of the oil and gas industry of the Republic of Tatarstan and the Russian Federation.

The master's program advances the knowledge of postgraduate students in the fields of petroleum engineering and geomechanics. The obtained skills allow future specialists to freely navigate in modern software systems for reservoir simulations and develop their own software for modeling of oil production processes.

The term of study is 2 years.

Future professional fields

- geological and hydrodynamic modeling, control and optimization of development of oil and gas reservoirs,

- interpretation of the results of hydrodynamic studies of wells,

- design and efficiency prediction of geological and technical measures.

Applicants

Targeted applicants are graduates of bachelor's programs in the field of science, possessing basic knowledge in the field of mathematics, mechanics, physics, programming, and/or geology. In the first semester, students are offered a number of elective courses developed to uniform level out the differences in undergraduate education.

Obligatory disciplines

- geological modeling of oil and gas reservoirs,

- hydrodynamic modeling of oil and gas reservoirs,

- rock mechanics of oil and gas reservoirs,

- mathematical modeling of geological and technical measures.

Elective courses

- theory of the geology of oil and gas reservoirs / solid mechanics,

- theory of the petroleum reservoirs waterflooding / fluid mechanics,

- methods for solving of grid equations / soil mechanics,

- theory of the multiphase flows in porous media / mechanics of composite materials,

- up-to-date software for

  - geological modeling of oil and gas reservoirs,

  - hydrodynamic modeling of oil and gas reservoirs,

  - solving the problems of fluid mechanics,

  - solving the problems of solid mechanics.

It is planned to organize practical courses based on a number of oilfield services companies.

Software and programming

Students get acquainted with modern software for geological and hydrodynamic modeling of oil and gas reservoir (such as Schlumberger Petrel, Eclipse, PIPESIM, ROXAR RMS, Tempest, ResView, etc.), simulating geological and technical measures and interpreting well test results (CMG STARS, FracPRO, KAPPA Saphir and others). Numerical methods use various mathematical and CFD (Computational Fluid Dynamic) packages and programming environments, such as Matlab, Wolfram Mathematica, ANSYS Mechanical, ANSYS Fluent, etc. The basic programming language is C ++.

Specializations within this programme