Novosibirsk State University
*THE REAL SCIENCE

FUNDAMENTALS OF PHYSICS OF THE EARTH

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This course was designed to study the structure and shape of the Earth according to geophysical methods (seismology, electrometry, thermometry, gravimetry, magnetometry) and numerical modelling, material composition, and rocks in the Earth's interior under conditions of high temperature and pressure.

Course Objectives:

- present basic concepts about the possibilities and results of applying a complex of geophysical methods and numerical modeling in the study of the deep structure of the Earth, its material composition, and the state of rocks depending on temperature and pressure, geological applications of physics of continuous media as applied to solving problems of geodynamics of the earth crust and lithosphere;
- characterize the structures and relationships of different geophysical methods and its links with other disciplines, primarily mathematics and physics;
- demonstrate with examples advantages and limitations of different geophysical methods in solving typical geological problems.

Course Units:

1. The Hierarchy of Objects in Nature, the Theory of the Universe and the Solar System Origin.
2. Shape of the Earth
3. Earthquakes Physics
4. Introduction to Seismology
5. The Earth Structure According to Seismic Data.
6. Earth's Gravity Field
7. Methods of Gravity Prospecting
8. Earth's Magnetic Field
9. Methods of Magnetic Prospecting and Paleomagnetism.

10. Thermal Field of the Earth
11. Geoelectric Field of the Earth
12. Methods of Electrical Prospecting
13. Tectonics of the Lithospheric Plates.
14. Rheological Processes and Properties of the Earth.
15. Modeling of Geodynamic Processes.