NON-PROFIT JOINT STOCK COMPANY
"KAZAKH NATIONAL RESEARCH TECHNICAL UNIVERSITY NAMED AFTER K.I. SATBAYEV"

Institute of Geology and Oil and Gas Engineering named after K. Turyssov
Department of Geophysics and Seismology

EDUCATIONAL PROGRAM
7M05304 - «Applied Seismology»

Code and classification of the field of education: **7M05 «Natural sciences, mathematics, and statistics »**
Code and classification of training directions: **7M053 «Physical and Chemical Sciences»**
Group of educational programs: **«M091 «Seismology»**
Level based on NQF:**7**
Level based on IQF:**7**
Study period: **1 year**
Amount of credits: **60**

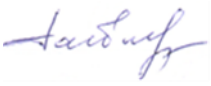
Almaty 2025

Educational program 7M05304 – «Applied Seismology» was approved at the meeting of K.I. Satbayev KazNRTU Academic Council
Minutes # 9 dated «20» February 2025 y.

was reviewed and recommended for approval at the meeting of K.I. Satbayev KazNRTU Educational and Methodological Council
Minutes #4 dated «03» February 2025 y.

Educational program 7M05304 – «Applied Seismology» was developed by Academic committee based on direction «7M053 «Physical and Chemical Sciences»

Full name	**Academic degree/ academic title**	**Position**	**Workplace**	**Signature**
Teaching staff:				
Boranbai Tovbasarovich Ratov	Doctor of Technical Sciences, Professor	Head of the Department of Geophysics and Seismology	Kazakh National Research Technical University named after K.I.Satpayev	
Abetov Auez Egemberdievich	Doctor of Geological and Mineralogical Sciences	Professor	Kazakh National Research Technical University named after K.I.Satpayev	
Umirova Gulzada Kubashevna	Doctor of PhD	Associate Professor	Kazakh National Research Technical University named after K.I.Satpayev	
Temirkhanova Raushan Galimzhanovna	Doctor of PhD	Associate Professor	Kazakh National Research Technical University named after K.I.Satpayev	
Siylkanova Akgenzhe Orishanovna	Doctor of PhD	Senior Teacher	Kazakh National Research Technical University named after K.I.Satpayev	

Aliakbar Madiyar Manarbekuly	Master of Technical Sciences	**Senior Teacher**	Kazakh National Research Technical University named after K.I.Satpayev	
Employers:				
Mikhailova Natalia Nikolaevna	Doctor of Physical and Mathematical Sciences	Director	Kazakhstan National Data Center (KNDC)	
Uzbeks Nursarsen Bolataevich	Candidate of Physical and Mathematical Sciences	Deputy Director of Science	Institute of Seismology	
Students				
Dosymbekova Zhansaya	Master of Technical Sciences	Doctoral student 2 years of study	Institute of Seismology	
Isagali Asem	Master of Technical Sciences	Doctoral student 2 years of study	Kazakhstan National Data Center (KNDC)	
Muzapparova Akerke Bakbergenovna	Master of Technical Sciences	Doctoral student 1 years of study	Kazakh National Research Technical University named after K.I.Satpayev	

General information

№	Field name	Comments
1	Code and classification of the field of education	7M05 «Natural Sciences, Mathematics, and Statistics»
2	Code and classification of training directions	7M053 «Physical and Chemical Sciences»
3	Educational program group	M091 «Seismology»
4	Educational program name	7M05304-«Applied Seismology»
5	Short description of educational program	The Master's program in 7M05304-«Applied Seismology» provides: a) In-depth knowledge in the field of seismology – understanding the nature of seismic waves, the structure of the Earth's crust and upper mantle, methods for studying the Earth's crust, earthquake prediction, seismic hazard assessment, the damage caused by strong earthquakes, deep tectonic processes, and seismicity related to the exploration of natural resources. b) Skills in working with seismological equipment – installation and maintenance of seismological instruments, placement of seismic stations, working with broadband, short-period, and long-period seismometers, calibration and testing, connection to telemetry systems, data analysis from seismic stations, use of portable seismometers, working with accelerometers, and the registration and recognition of underground nuclear tests using seismic methods. c) Programming and data analysis – using specialized software to process seismograms and analyze the data from earthquake focal mechanisms: SeisComP for earthquake monitoring and automatic seismic record processing, SAC (Seismic Analysis Code) for waveform analysis and seismogram processing, GMT (Generic Mapping Tools) for visualizing seismic data and constructing maps, ObsPy (Python library) for programming and automating seismic data processing, MATLAB and Seismic Unix for signal analysis, filtering, and model construction. d) Mathematical and physical thinking – working with signal processing algorithms, numerical modeling, and statistical data analysis. e) Engineering skills – understanding the basics of construction and soil mechanics to assess seismic hazards for infrastructure objects.
6	Purpose of EP	The program is aimed at training specialists who are able to work in scientific, research and production organizations, monitor seismic activity and implement innovative solutions in the field of seismology. Graduates can participate in the creation of seismic zoning maps, the development of measures to reduce seismic hazard, as well as in the organization and coordination of work taking into account the principles of inclusiveness and sustainable development
7	Type of EP	

8	The level based on NQF	New EP
9	The level based on IQF	7
10	Distinctive features of EP	7
11	Education form	Full-time
12	Period of training	1 year
13	Amount of credits	60
14	Languages of instruction	Kazakh, Russian, English
15	Academic degree awarded	Master of Sciences
16	Developer(s) and authors	Professor A.E. Abetov, Associate Professor G.K. Umirova, Senior Teacher A.O. Siylkanova, Teacher S.K. Dossaibekova, Teacher B.A. Baltabayeva