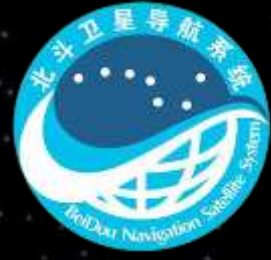
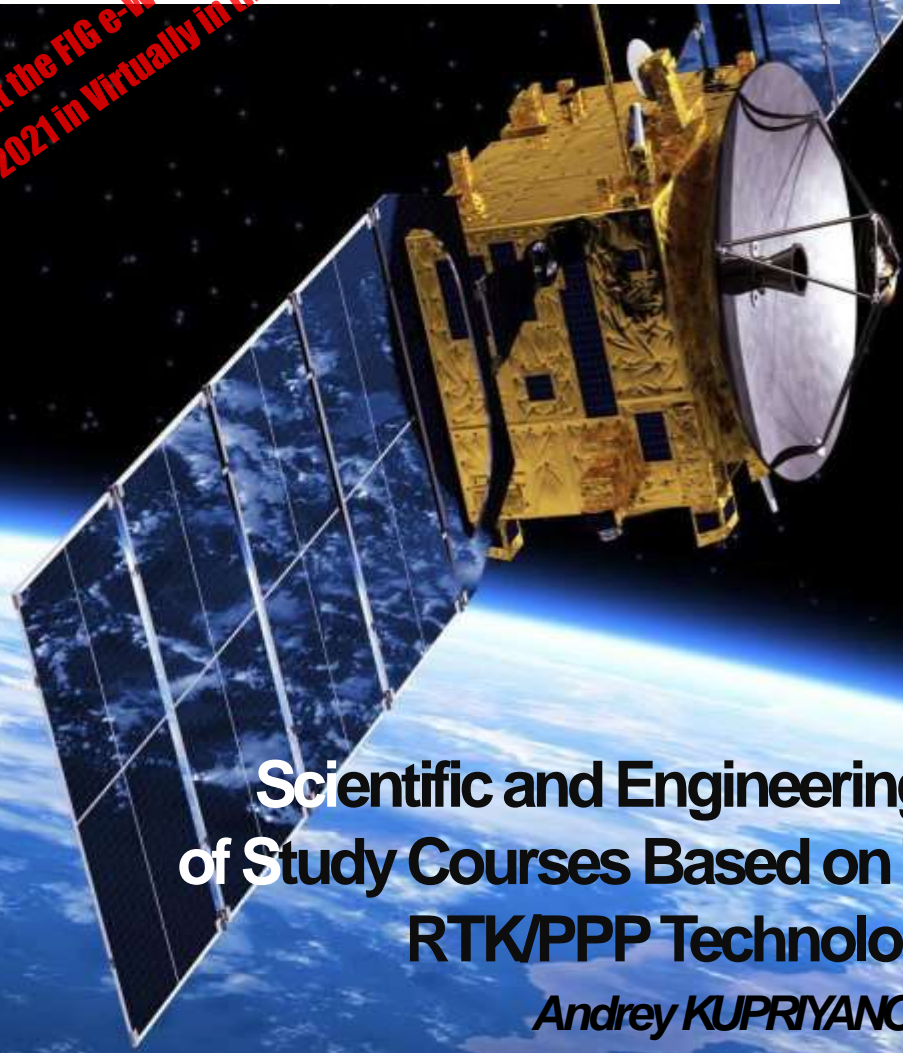




eWORKING WEEK 2021 20-25 JUNE
 SMART SURVEYORS FOR LAND
 AND WATER MANAGEMENT
CHALLENGES IN A NEW REALITY

**Presented at the FIG e-Working Week 2021,
 21-25 June 2021 in Virtually in the Netherlands**



Scientific and Engineering Approaches of Study Courses Based on The GNSS- RTK/PPP Technology

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 Dobrynia ALIBIN*

Moscow State University of Geodesy and Cartography



Moscow State University of Geodesy and Cartography

Moscow State University of Geodesy and Cartography (MIIGAiK) is one of the oldest educational institutions in the Russian Federation, has been founded in 1779.



In 2010 MIIGAiK became an official partner of the Bologna club and actively supports and promotes the idea of the Bologna process which targets at the approximation and harmonization of higher education systems of European countries with the aim of creating a common European Higher Education Area (EHEA).

More than 5,500 students and the post gradulators are studying in MIIGAIK at the present time;
The class of gradulators is more than 500 annually;

Moscow State University of Geodesy has multi-level educational system:

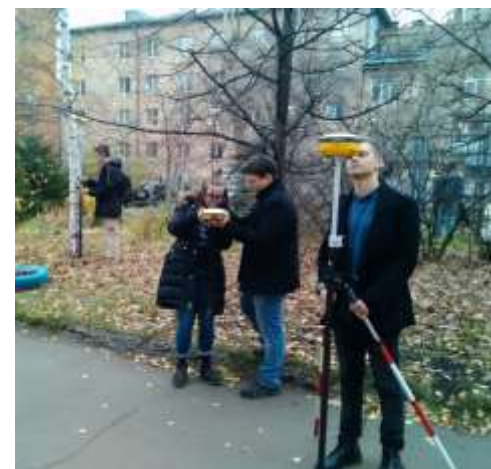
- Pre-higher education courses, Bachelor's program, Specialist program, Ph.D. degree program,
- Extended education courses, Professional development programs, Graduate school, Doctoral candidacy

GNSS APPLICATIONS and STUDY

**Engineering survey Construction surveying;
Deformation measurement; BIM;
Geoinformation/GIS; GNSS/Inertial; Measurement Unit (IMU);
Ionosphere; Cadaster; Land management Positioning;
e-Governance; Reference networks;
Precise Point Positioning Real Time Kinematic; (PPP/RTK);
Balance of Measurements Errors; Professional practice;
Low cost technology; Education;**

Basic GNSS education courses MIIGAIK

Fundamental Concepts, Coordinate and Time Systems
Space Geodesy and Satellite Orbit Theory
Concept of Ranging and GNSS Observables Determination
Navigation Solution Calculation
Error Sources and Accuracy Determination
Atmospheric Effects and Associated Scientific Measurements
Signal and Communication System Theory
Differential GNSS(e.g., DCM/WAAS/EGNOS/MSAS/GAGAN)
GNSS Modernization Reference



Survey GNSS Scientific and Study Laboratories and Field Testing With the Involvement of Students and Post-Graduates

MIIGAiK conducts the full cycle of laboratory and field testing, as well as the comparative analysis of the of the equipment specification. are used during “Applied Survey“ and “Geodesy and Remote Sensing” students take regular courses of training with GNSS receivers.



MIIGAiK Educational Activity in High-Precision GNSS technology scientific researches

Besides the practical skills in engineering areas students get opportunity to participate in scientific laboratory researches. Currently, there are seven research directions in focus of this laboratory:

1. Experimental Studies of a Dynamic Real-Time Mode Relative to a Moving Base Station
2. Orbital Method Evolution by Precise Point Positioning Technology Development
3. Operational Monitoring of the Parameters of the Ionosphere in the Local Area Using the Results of Multi-frequency GNSS-Measurements
4. Development of Architecture Survey GNSS Receiver Based on Client-Server Architecture
5. Developing the Algorithm to Analyze the Navigation Signal Reflections with the Purpose to Study the Effect of Multipath at the GNSS Measurements
6. A Model of Portable Multisystem GNSS Receiver With Precise Positioning Capability Based on PPP And Differential Correction Methods
7. Estimation of The Combined INS/GNSS System Positioning Accuracy When The Breaking of Navigation Signals Reception



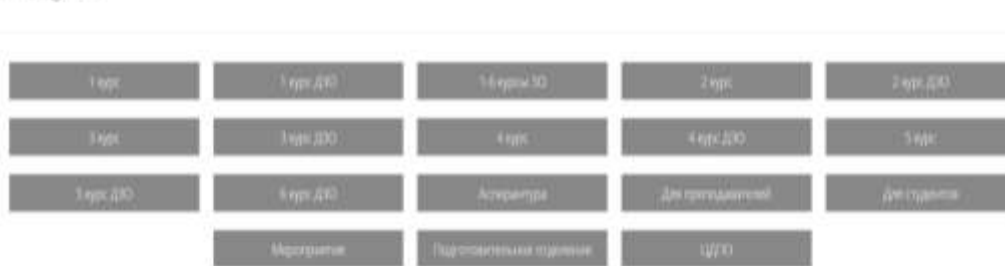
External Educational Activity of MIIGAIK Republic Kyrgyzstan, Siberian and Ural regions



The Impact of Using E-Learning during the COVID-19 in Moscow State University of Geodesy and Cartography

- In response to the emerging and ever solution to the COVID-19 outbreak, the MIIGAiK higher education system is operating through e-Learning system.
- Educators are motivated to make use of new technologies to enhance teaching, learning, and overall education performance. Moreover, the new situation has presented a need for greater integration of technology as a platform and environment to educate students.
- The distance learning tools implemented in response to the education crisis caused by the COVID-19 pandemic have revealed the potential of new technologies, especially those using e-Learning and Information and Communication Technologies in education.
- Distant learning and Informatization university divisions have implemented several major updates making system more advanced and easy to use.
- The MIIGAiK has switched to the distance format of passing the tests, examinations, attestations and diplomas graduating also.

Categories



MIIGAiK distant learning department internet system available at <https://sdo.miigaik.ru/>

Study Programs for Specialists in the Wide Range of Areas

Cross-university system of distant learning

Bases
of satellite
navigation

Applications of
satellite
navigation

Bases
of remote sensing

Intergrated use
of GNSS
and RS data

Applications of
remote sensing

More than 1000 hours of theoretical and practical training in Static/RTK/PPP on modern use cases



Construction and operation
of oil and gas facilities



Nuclear power plants and
unique facilities



Precision Agriculture



Polar regions researches

**DISTANT
LEARNING
FACILITIES**



Information-Analytical Complex

Automated Complex of Distant Learning

Complex of Scientific, Technical and Methodical Supply



Thank you!



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