Course/module description

Course provider (institution)	Osh Technological University named after M. Adyshev (OshTU)
Course title	**Earth observation**
Target group	PhD Students (Cartography and Geoinformation)
Type (compulsory/optional):	Mandatory
Number of ECTS credits allocated (if applicable); estimated workload	6 ECTS (180 academic hours)
Mode of delivery (face-to-face/ distance learning etc.); number of contact hours	90 hours **(**face-to-face hours)
Language of instruction	Kyrgyz/Russian/ English
Prerequisites and co-requisites (if applicable)	Geographic Information Systems (GIS), Informatics and some programming experience in any language.
Course aims:	The purpose of the discipline "Earth observation" - Basics of Remote Sensing, as it uses to mapping the Earth's surface, various phenomena on it and to understand how the Earth works. These approaches include observing the Earth in various forms from sensors from satellites, planes, drones and ships. Understanding the electromagnetic spectrum of radiant energy and radiation emitted from the Earth's surface provides a basis for understanding the types of images available and their characteristics. Image enhancement, classification and quantification techniques have been explored with attention to integration with GIS datasets. The application of remote sensors to change land cover, vegetation classification and environmental quality have been explored.
Learning outcomes:	- Recognizing and using subject-specific theories, paradigms, concepts and principles; - Collecting and integrating several lines of evidence to formulate and test hypotheses - Applying knowledge and understanding to address familiar and unfamiliar problems;
Competences	-
Course content:	The syllabus will cover topics from: • Introduction in Remote Sensing • Remote Sensing of the Environment • Physical principles of remote sensing • Aerial Photography • Elements of Visual Image Interpretation • LIDAR Remote Sensing

Recommended or required reading and other learning resources/tools:	***1. Lecture Materials*** ***2. Software:*** GoogleEarthPro, ArcGIS, online mapping tools (e.g. GoogleMaps, R) ***3. Recommended Books:*** 1. Barnsley,, M.J., 1999. Digital remotely-sensed data and their characteristics. In, Geographical Information Systems, vol. 1, Principles and technical Issues, pages 451-466 (Nice overview of general application of remote sensing and background concepts, not an equation in sight). 2. Lillesand, T.M., and Kiefer, R.W., 2000. Remote sensing and image interpretation. Chapter 1, pages 1-52 (general coverage of background principles but readable, little maths and any used is presented at an easily understandable level). 3. Campbell, J.B., 1996. Introduction to Remote Sensing. Chapters 1 & 2, pages 1-39 (less detailed but similar coverage to the previous text plus chapter 1 gives a good history/rationale of remote sensing). 4. Mather, P.M., 1999. Computer processing of remotely-sensed images. Chapter 1, pages 1-27 (Sound introductory material presented in a readable manner, not much maths, any used is explained by examples).
Planned learning activities and teaching methods:	1. Regular lectures; 2. Laboratory and practical work 3. Discussions in class
Assessment methods and criteria:	1. Mid-term exam (25%) 2. Labs and computing tasks (25%) 3. Class discussion/participation (10%) 4. Final exam 40%
Additional information:	Course instructor – Nurgul Kadyrkulova Contacts: kadyrkulova74@mail.com, mob.tel.: +996-773-682944