

## Course/module description

<b>Course provider (institution)</b>	Osh Technological University named after M. Adyshev (OshTU)
<b>Course title</b>	Advanced Remote Sensing
<b>Target group</b>	PhD Students (Cartography and Geoinformation)
<b>Type (compulsory/optional):</b>	Mandatory
<b>Number of ECTS credits allocated (if applicable); estimated workload</b>	5 ECTS (150 academic hours)
<b>Mode of delivery (face-to-face/ distance learning etc.); number of contact hours</b>	45 hours (face-to-face hours)
<b>Language of instruction</b>	Kyrgyz/Russian/ English
<b>Prerequisites and co-requisites (if applicable)</b>	Geographic Information Systems (GIS), Informatics and some programming experience in any language.
<b>Course aims:</b>	<p>This course aims at providing practical knowledge and in-depth understanding of of the Remote Sensing. Through practical applications and real-world examples, students will be provided with necessary skills to generate and analyze high-level remote sensing products.</p> <p>Specific objectives are:</p> <ul style="list-style-type: none"> <li>- to train students on remote sensing data type and formats, imagery products and their availability;</li> <li>- to give insights on processing methods and techniques for handling radiometric and geometric properties of remotely sensed;</li> <li>- to give principles and methods of multi-resolutions and multi-spectral data fusion, multitemporal processing and accuracy assessment;</li> <li>- to develop data processing automation through batch processing.</li> </ul>
<b>Learning outcomes:</b>	<p>On completion of this course, students will be able to:</p> <ul style="list-style-type: none"> <li>- Explain and communicate quantitative remote-sensing principles and integrate different tools for remote sensing data analysis.</li> <li>- Perform image corrections and enhancements and generate high-level remote sensing products.</li> <li>- Manipulate and process RS data using manual and automated techniques</li> <li>- Critically compare different type of remote sensing data products and analysis technique and select the more appropriate to solve a real-world problem.</li> </ul>
<b>Competences</b>	-

<b>Course content:</b>	<p>The syllabus will cover topics from:</p> <ul style="list-style-type: none"> <li>• Remote Sensing data types and formats</li> <li>• Multi-source and multi-resolution data products (Landsat, ASTER, MODIS, EO-1, DTMs, Sentinel-2).</li> <li>• Techniques of Radiometric and Geometric Correction</li> <li>• RS Image Fusion</li> <li>• Multitemporal Remote Sensing and Accuracy Assessment</li> </ul>
<b>Recommended or required reading and other learning resources/tools:</b>	<ol style="list-style-type: none"> <li>1. <i>Lecture Materials</i></li> <li>2. <i>Software:</i> Agisoft Metasphere, QGIS, ESA Sentinel Toolboxes, Multitemporal RS</li> <li>3. <i>Recommended Books:</i> <ul style="list-style-type: none"> <li>• Remote Sensing Digital Image Analysis - An Introduction (Fifth Edition). Springer-Verlag Berlin Heidelberg, 2013.</li> <li>• Image processing and GIS for remote sensing: techniques and applications, Chichester, Chichester, Wiley-Blackwell, 2016.</li> </ul> </li> </ol>
<b>Planned learning activities and teaching methods:</b>	<ol style="list-style-type: none"> <li>1. Regular lectures;</li> <li>2. Laboratory and practical work</li> <li>3. Discussions in class</li> </ol>
<b>Assessment methods and criteria:</b>	<ol style="list-style-type: none"> <li>1. Mid-term exam (25%)</li> <li>2. Labs and computing tasks (25%)</li> <li>3. Class discussion/participation (10%)</li> <li>4. Final exam 40%</li> </ol>
<b>Additional information:</b>	<p>Course instructor – Gulshaan Ergeshova  Contacts: <a href="mailto:gulshaan.ergeshova@gmail.com">gulshaan.ergeshova@gmail.com</a>  Cell: +996 556 112 279</p>