COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚGE/ ZDPZ/21	**Course name:** Basics of remote sensing of the Earth

Course type, scope and the method:
Course type: Lecture / Practice
Recommended course-load (hours):
Per week: 2 / 2 **Per study period:** 28 / 28
Course method:

Number of ECTS credits: 6

Recommended semester/trimester of the course: I. (Bachelor)

Course level:

Prerequisities:

Conditions for course completion:
The evaluation is based on a combination of continuous control during the exercises and the exam. Continuous control is carried out during the teaching part in the form of 2 written tests, 3 exercises and a semester team project. Each element is evaluated in the range of 0 - 100 points. • The content of assignments is solved gradually in exercises that are aimed at solving the assigned problem by analyzing data layers from the DPZ and interpreting the results. The output of the assignment is the preparation and submission of a report of around 1,000 words with map attachments. • To solve the semester project, students are divided into teams of 3-4 people. The topics (focus) of the semester project are determined by the team of students themselves in the middle of the semester based on knowledge from DPZ/GIS and their own interest. The assessed output of the project is a text report on the solution of the assigned task, a sample of input and final data (10 minutes) and a presentation of the project by all team members (10 minutes). The project report (about 1500 words and graphic attachments) is handed in and the presentation is made at the end of the teaching part of the semester as part of the exercises. Each team member can get 0-100 points for the project and its presentation. In the teaching part, 2 written tests are carried out, in the middle and at the end of the semester, focused on practical tasks in DPZ and proposals for solutions of specific applications with DPZ. • During the exam period, a written exam focusing on theoretical and methodological aspects of GIS is carried out in the scope of 3 questions, in which an explanation of the supporting topics, problems and applications of GIS is expected. A student who has obtained at least 50 points for each form of assessment in the teaching part (in the interim control) can apply for the exam. • The final evaluation of the subject is determined as the arithmetic average of the evaluation of 2 tests, 3 assignments, 1 semester project and 1 final exam. Credits will only be awarded to a student who achieves at least 50 points out of 100 in each part of the assessment. For the final evaluation of the subject, the evaluation scheme applies: A (100-90 points), B (80-89 points), C (70-79 points), D (60-69 points), E (50-59 points), FX (0-49 points).

Learning outcomes:
1. knowledge of theoretical and methodological aspects of remote sensing of the Earth and the possibilities of their application;
2. practical skills in processing, analysis and visualization of digital data from remote sensing in the GIS environment and other software for use in geographic information systems;
3. ability to critically evaluate the advantages and disadvantages of remote sensing methods and sensors for different applications;
4. ability to work in a team and independently, presentation of work results

Brief outline of the course:
• The course focuses on the following topics: Remote Sensing (RS) as a scientific discipline and

historical context, physical principles of remote sensing - electromagnetic radiation, spectrum, interaction of the landscape with electromagnetic radiation, spectral behavior of objects in the landscape, satellite, aviation, unmanned and terrestrial remote sensing sensors, main principles and use of passive remote sensing methods (multispectral, thermal, hyperspectral scanning, photogrammetry) and active remote sensing methods (radar, lidar / laser scanning, sonar), access and sources of remote sensing data on the Internet (eg Copernicus) and applications of Remote sensing.
• Exercises are focused on working in various software, especially ArcGIS Pro, Quantum GIS, Multispec, LAStools, Photomod Lite and include: searching and obtaining satellite multispectral data on the Internet, radiometric and atmospheric correction of multispectral images and color compositions from them, supervised and unsupervised classification of multispectral images and evaluation of its quality, processing of aerial stereo images and orthorectification, conversion of thermal record to earth surface temperature, filtration and classification of lidar data (from laser scanning), analysis of radar record. Students learn the topics of the semester project in the middle of the semester and solve the assigned task in the team using the skills and knowledge acquired during the semester.

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 6

Course assessment is visible only in case of include the course to some study plan.

Provides: doc. Mgr. Michal Gallay, PhD.

Date of last modification: 18.04.2021

Approved: