

COURSE DESCRIPTION

University:	University of Prešov in Prešov		
Faculty:	Faculty of Humanities and Natural Sciences		
Code: 2GAG/DPZEG	Title: Fundamentals of Remote Sensing		
Field of study: Earth Sciences			
Study programme: Geography and Applied Geoinformatics (2 nd degree)			
Guarantee: prof. Ing. Jozef Vilček, PhD.		Lecturers: doc. RNDr. Štefan Koco, PhD.	
Semester:	Forms of teaching:		Number of credits:
Summer	Lectures, seminars		
	Recommended number of hours:		
	Per week: 1/1 Total per study: 13/13		
Prerequisites:			
Assessment: exam			
Course assessment: individual work, presentation			
Final assessment: exam			
Term project processing: To obtain grade A (excellent) must obtain at least 90%, to obtain grade B 80%, to obtain grade C at least 70%, to obtain grade D 60%, to obtain grade E at least 50%. A student who receives less than 50% will be assessed the degree FX. Credits will not be awarded to a student who doesn't submit term project or project level will be assessed degree of FX.			
Objective:			
By the end of the course, students will be able to:			
<i>Knowledge:</i>			
- define and describe the object and subject of remote sensing;			
- explain the substance of remote sensing;			
- describe the methods used by remote sensing;			
- describe procedures for processing digital non-contact record;			
- name the most common applications of remote sensing methods in geoscience disciplines;			
<i>Skills:</i>			
- self-search resources of remote sensing data;			
- apply procedures of processing digital non-contact record by computer tools;			
<i>Competences:</i>			
- use tools and methods of remote sensing for research of objects properties and phenomena laws connected with the earth surface.			

Course content:

1. Introduction, basic concepts, historical overview – basic assumptions, the dividing of remote sensing methods (RS).
2. The physical principles of remote sensing - electromagnetic radiation, atmospheric windows, the basic zone of the spectrum, useful in remote sensing.
3. The spectral behaviour of objects - selected kinds of surfaces, vegetation, water, snow and ice, soils, minerals and rocks.
4. Conventional (photographic) methods of sensing the earth's surface - aerial photography, photographic materials, colour images, filters, aerial photography properties.
5. Basics of analogue interpretations images and aerial photography - the interpretation of images, interpretive signs, interpretive keys, photographic chamber, digital cameras, aerial photography, snapshot flights.
6. Unconventional methods of sensing the earth's surface - television systems, scanners, satellite systems, digital images and their characteristics, the basic methods of visualization.
7. Unconventional methods of sensing the earth's surface - an overview of satellite systems (LANDSAT, SPOT, IRS, IKONOS ...).
8. Remote sensing in the optical part of the spectrum - characteristics, applications selected projects using remote sensing data.
9. Imaging spectrometry - the principle of hyperspectral imaging, examples of use, vegetation and environmental mapping.
10. Remote sensing in the thermal part of the spectrum - physical nature of thermal records, appearance and properties of thermal images, examples of applications.
11. Remote sensing in the microwave part of the spectrum - radar (SAR, SLAR), the geometric properties of radar images, radar systems.
12. Remote sensing in the microwave part of the spectrum - interferometry, altimetry, LIDAR.

Literature:

Required literature:

ALBERTZ, J., 1991: Grundlagen der Interpretation von Luft – und satellitenbildern. Wissenschaftliche buchgesellschaft, Darmstadt, 196s.; LILLESAND, T. M., KIEFER, R. W., 2002: Remote Sensing and Image Interpretation., New York, John Wiley&Sons,, 724 S.; JENSEN (2005): Introductory Digital Image Processing. Prentice Hall, 526 S.; Canadian Centre for Remote Sensing (2012): Fundamentals of Remote Sensing (učebný text v angličtine, in English), 256 s. URL: <http://www.nrcan.gc.ca/earth-sciences/geography-boundary/remote-sensing/fundamentals/1430>

Language the course is taught in:

English

Signature of guarantee and date of last edition:

March 2025