Course Unit Descriptor

Study Programme: Geodesy

Course Unit Title: Photogrammetry and Remote Sensing

Course Unit Code:

Name of Lecturer(s): Associate Professor Vukan Ogrizović

Type and Level of Studies: Bachelor Academic Degree

Course Status (compulsory/elective): Compulsory

Semester (winter/summer): Summer

Language of instruction: English

Mode of course unit delivery (face-to-face/distance learning): Face-to-face

Number of ECTS Allocated: 5

Prerequisites: None

Course Aims:

Acquiring knowledge in the field of using remote sensing photos (satellite and airborne (aero) - airborne, drone,...) for getting various information about space. Using the analogue and digital photos, as well as, by scanning, one can reach information about a surveyed field or on object.

Learning Outcomes:

This course contributes to contemporary professional training of the students, by educating geodetic staff for applying new technologies. That gives an opportunity for the students to acquire new knowledge and the skills in the area of using the various photos for obtaining geodetic products.

Syllabus:

Theory

1. The remote sensing term - definitions, applications, historical development. The application areas. Basic principles of photogrammetry. The basic principles of remote sensing.
2. Classification of remote sensing sensors. Physical basics of electromagnetic radiation.
3. Snapshots obtained by the photo procedure, a scanner, a digital CCD camera and a radar. Geometric and radiometric characteristics of the aerial and the satellite pictures.
4. Systems for remote photographing - the aero-photogrammetric measuring cameras, the terrestrial measuring cameras, the scanner systems, the radar system, auxiliary equipment
5. Obtaining of the digital images. Digital image processing.
6. The procedures and a method of the pictures content recognition. Mathematical basics of the single image (the image coordinate system, equations of co-linearity)
7. Test I.
8. Mathematical basics of a stereo-pair (relative and absolute orientation)
9. Aero-triangulation and photo-triangulation of an independent models block
10. Adjustment of the block by the beam method
11. Application review of the aerial and the satellite images in various engineering and social works and activities
12. New remote sensing techniques (basic terms) - UAVs, pictometry,...
13. Close-range photogrammetry and its engineering application
14. Integration of remote sensing and GIS

15. Test II.

Practice

The practical exercises follow the theoretical lessons.

Required Reading:

1. Carl Kraus: Photogrammetry, Book 1 - Basics and standard procedures, Naučna knjiga, Beograd, 1986.
2. Script.

Weekly Contact Hours: 60	**Lectures:** 30	**Practical work: 30**

Teaching Methods:

Lectures and students group work

Knowledge Assessment (maximum of 100 points): 100

Pre-exam obligations	points	**Final exam**	points
Active class participation	5	written exam	
Test I and Test II	5 (practice) + 40	oral exam	50
Preliminary exam(s)		…….	
Seminar(s)			

The methods of knowledge assessment may differ; the table presents only some of the options: written exam, oral exam, project presentation, seminars, etc.