
Course title: RADAR REMOTE SENSING

ECTS credit allocation (and other scores): 2

Semester: autumn

Level of study: ISCED-7 - second-cycle programmes (EQF-7)

Branch of science: Engineering and technology

Language: English

Number of hours per semester: 30

Course coordinator/ Department and e-mail: Magdalena Mleczko, magdalena.mleczko@uwm.edu.pl

Type of classes: classes and lectures

Substantive content

CLASSES: SAR satellite systems. Access to SAR data, software tools for SAR image processing. Remote sensing big data infrastructure cloud computing. Pre-processing of Sentinel-1 data. Calibration and radiometric normalization of SAR data. Speckle filtering methods. Geometric corrections of SAR data. Analysis of SAR amplitude – flood monitoring, agriculture applications. DEM generation.

LECTURES: Introduction to SAR remote sensing. SAR data acquisition. Key characteristics of amplitude SAR imagery. Thematic applications based on SAR amplitude. Interferometric SAR for DEM generation. DInSAR for deformation monitoring – concepts, procedure, discussion of examples, validation. Persistent Scatterer Interferometry – concepts, procedure/remarks, products, discussion of examples.

Learning purpose: Student has knowledge and skills of radar satellite remote sensing technologies.

On completion of the study programme the graduate will gain:

Knowledge: Student has a wide-ranged knowledge of radar satellite remote sensing technologies.

Skills: Student has a wide-ranged competence in radar satellite remote sensing data processing.

Social Competencies: Student is able to work efficiently in the team, to organize team's cooperation during carrying out of different engineering projects.

Basic literature: 1) Woodhouse I., Introduction to Microwave Remote Sensing, Taylor and Francis, 2006; 2) Veci L., SENTINEL-1 Toolbox. SAR Basics Tutorial, ESA, 2016; 3) Veci L., Sentinel-1 Toolbox. Interferometry Tutorial, ESA, 2016

Supplementary literature: 1) Alparone et al., Remote Sensing Image Fusion, CRC Press, 2015; 2) Richards J.A, Remote Sensing with Imaging Radar, Springer, 2009

The allocated number of ECTS points consists of:

Contact hours with an academic teacher: 30 h

Student's independent work: 30 h