
Course title: GPR MEASUREMENT

ECTS credit allocation (and other scores): 3

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: 45

Course coordinator/ Department and e-mail: Adam Ciećko, PhD, Institute of Geodesy, a.ciecko@uwm.edu.pl

Type of classes: classes and lectures

Substantive content

CLASSES: GPR systems and antennas; GPR assessment of roads; Detection and localization of utilities in urban areas by using GPR; GPR assessment of buildings.

LECTURES: Introduction to GPR; GPR applications in civil engineering; GPR applications in other areas, including cultural heritage, environment, agriculture, and humanitarian operations; GPR data processing and interpretation; Safety.

Learning purpose: Presentation to students the most important aspects of Ground Penetrating Radar (GPR). Introduction to the theory of propagation of electromagnetic waves in the ground structure; construction and principle of operation of the GPR; the most important applications of the GPR in civil engineering.

On completion of the study programme the graduate will gain:

Knowledge: Student describes the principles of the GPR method. Defines the basic parameters of the GPR antenna and their influence on the obtained results of measurements. Gives examples of engineering tasks to which GPR measurements can be applied.

Skills: Can plan field measurements and experiments. Correctly configures the measuring equipment. Makes measurements with their previous assumptions. Is able to process and interpret the obtained results.

Social Competencies: Student is aware of the benefits of working in a group. Gives examples of advantages of team-based problem-solving.

Basic literature: 1) Harry M. Jol, Ground Penetrating Radar: Theory and Applications, wyd. Elsevier, 2009 ; 2) J. Karczewski, Ł. Ortyl, M. Pasternak, Zarys metody georadarowej, wyd. AGH, 2011 ; 3) A. Benedetto, L. Pajewski, Civil Engineering Applications of Ground Penetrating Radar, wyd. Springer, 2015 ; 4) D. Goodman, S. Piro, GPR Remote Sensing in Archaeology, wyd. Springer, 2013 ; 5) D.J. Daniels, Ground Penetrating Radar - 2nd Edition, wyd. The Institution of Electrical Engineers, 2004

Supplementary literature: M. Pasternak (red.), Radarowa penetracja gruntu, wyd. WKŁ, 2015.

The allocated number of ECTS points consists of: 75

Contact hours with an academic teacher: 50

Student's independent work: 25