UNIVERSITY OF WARMIA AND MAZURY IN OLSZTYN

Faculty of Geoengineering

Course title: SEWAGE SYSTEMS

ECTS credit allocation (and other scores): 5.0

Semester: spring

Level of study: ISCED-6 - first-cycle programmes (EQF-6)

Branch of science: Engineering and technology

Language: English

Number of hours per semester: 30/30

Course coordinator/ Department and e-mail: prof. dr hab inż. Wojciech Janczukowicz/Department of Environmental Engineering; jawoj@uwm.edu.pl

Type of classes: classes and lectures

Substantive content

CLASSES: Calculation of the amount of wastewater using the calculation method, using the efficiency curve and the nomogram. Calculation of flows in closed and open channels. Principles of designing a sanitary and rainwater sewage system. Determining the amount of wastewater based on the spatial development plan. Dimensioning of channels and alignment of wastewater tables in sanitary and rain sewage systems.

LECTURES: Systems and types of sewage. Wastewater quantities, channel sections, hydraulic calculation of channels. Principles of designing sewage networks. Weapons and materials for the construction of networks. Vacuum and overpressure sewerage. Sewage pumping stations and pumping stations. Construction of sewage networks. Trenchless technologies in the construction and renovation of networks. Legal basis for the operation of sewage systems, sewage collection. Reliability of the sewage system. Operational procedures, maintenance, health and safety. Environmental aspects of the construction and operation of sewage networks.

Learning purpose: Understanding the principles of designing and operating systems for the discharge of all types of wastewater and rainwater from urban areas.

On completion of the study programme the graduate will gain:

Knowledge: Has knowledge of how to determine the amount of wastewater using various methods, calculate flows in closed and open channels. He knows the rules of designing the sanitary and rainwater sewage system - determining the amount of sewage based on the spatial development plan, dimensioning the channels and aligning the wastewater table in the sanitary and rainwater sewage system, has knowledge about the construction, renovation and operation of the sewage system.

Skills: Performs hydraulic calculations of sewerage and rainwater sewage pipes, proposes the layout of the sewage system in the plan. He is able to dimension the sewage network, predict devices to control the operation of sewage pumping stations.

Social Competencies: Understands the need for continuous training and improvement of professional competences.

Basic literature:

1) Heidrich Z., Kalenik M., Podedworna J., Stańko G., Sanitacja wsi, wyd. Wydawnictwo „Seidel-Przywecki”, Sp. z o. o. Warszawa, 2008; 2) Bień J., Cholewińska M., Kanalizacja podciśnieniowa i ciśnieniowa, wyd. Skrypty Politechniki Częstochowskiej, 1995; 3) Weisman D., Komunalne przepompownie ścieków, wyd. Wydawnictwo „Seidel-Przywecki”, Sp. z o. o. Warszawa, 2001; 4) Denczew S., Królikowski A., Podstawy nowoczesnej eksploatacji układów

wodociągowych i kanalizacyjnych, wyd. Arkady, 2002; 5) Kwietniewski M., Roman M., Kloss-Trębaczkiewicz H., Niezawodność wodociągów i kanalizacji, wyd. Arkady, 1993

Supplementary literature:

1) Bajer J., Iwanejko R., Kapcia J., Niezawodność systemów wodociągowych i kanalizacyjnych w zadaniach, wyd. Wydawnictwa Politechniki Krakowskiej, 2006

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The allocated number of ECTS points consists of:

Contact hours with an academic teacher: 2.56

Student's independent work: 2.44