



Course title: **Information Technologies**

ECTS credit allocation (and other scores): 2.0

Semester: autumn

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

Branch of science: Engineering and technology

Language: English

Number of hours per semester: 45

Course coordinator/ Department and e-mail: dr inż. Rafał Kaźmierczak / Department of Land Management
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Type of classes: classes

Substantive content

The course covers topics related to the use of modern information technologies in spatial economy, including 3D modeling technology, spatial analysis, and tools supporting office work. The aim of the course is to familiarize students with tools for analyzing and visualizing spatial data, the use of augmented and virtual reality in spatial planning, and the implementation of cloud technologies.

- Information and its significance – definition, types of information, and the role of information in spatial economy.
 - Cloud computing and Microsoft technologies – using OneDrive, Microsoft Word, Excel, and PowerPoint in data analysis.
 - Modern office support tools – data integration, process automation, and online teamwork.
 - 3D modeling in spatial economy – basic modeling techniques, file formats, and interoperability.
 - Visualization of spatial data – using software to create dynamic and interactive presentations.
 - Modern visualization technologies – AR, VR, MR, and their applications in spatial analysis.
 - Holographic and anaglyph technologies in 3D visualization – applications in urban planning and spatial development.
 - Virtual tours and interactive visualizations – techniques for creating tours similar to Google Street View.
 - Basics of spatial analysis – an overview of fundamental methods for analyzing spatial data.
 - Artificial intelligence models – applications of AI
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On completion of the study programme the graduate will gain:

Knowledge:

W1 – The student knows the basic methods, techniques, tools and materials used in solving simple engineering tasks in the field of modern information technologies in spatial economy.

Skills:

U1 – Students will be able to use a virtual drive and work in the cloud, edit text in Microsoft Word, perform tasks in a Microsoft Excel spreadsheet and be able to create a multimedia presentation in Microsoft PowerPoint and use and create projects based on AR, VR, virtual walks.

U2 – The student is able to create designs in 3D software using various technologies.

Social competence:

K1 – The student knows the effects of engineering activities, including its impact on space and the natural environment and the related responsibility

Basic literature:

1. Badotra, S., Tanwar, S., Rana, A., Sindhwani, N., Kannan, R., Handbook of augmented and virtual reality, Wyd. De Gruyter., R. 2023
2. Doerner, R., Broll, W., Grimm, P., Jung, B., Virtual and augmented reality (VR/AR): Foundations and methods of extended realities (XR),



The allocated number of ECTS points consists of:

Contact hours with an academic teacher: 2

Student's independent work: 13