COURSE DESCRIPTION CARD

<table>
<tr><td colspan="10">Faculty of Civil Engineering and Environmental Sciences</td></tr>
<tr><td>Field of study</td><td colspan="6"></td><td>Degree level and programme type</td><td></td></tr>
<tr><td>Specialization/ diploma path</td><td colspan="6"></td><td>Study profile</td><td>Academic profile</td></tr>
<tr><td rowspan="2">Course name</td><td colspan="6" rowspan="2">GIS in environmental engineering</td><td>Course code</td><td>IS-FCEE-00034-1W</td></tr>
<tr><td>Course type</td><td>Erasmus</td></tr>
<tr><td rowspan="2">Forms and number of hours of tuition</td><td>L</td><td>C</td><td>LC</td><td>P</td><td>SW</td><td>FW</td><td>S</td><td>Semester</td><td>Winter</td></tr>
<tr><td></td><td></td><td></td><td>30</td><td></td><td></td><td></td><td>No. of ECTS credits</td><td>4</td></tr>
<tr><td>Entry requirements</td><td colspan="9">Basic knowledge of information technology; basis of geodesy, cartography and remote sensing is greatly appreciated</td></tr>
<tr><td>Course objectives</td><td colspan="9">The course provides an introduction to Geographic Information Systems and the class will focus on teaching through practical examples. The main objectives for the course are: Basic definition of maps and GIS; Difference between cartography and GIS; Theory of coordinate systems; Sources of spatial data (including paper maps and remote sensing data); Methods for modeling of environmental spatial data; Methods for visualizing and analyzing spatial data. Students will be able to draw numeric maps, to analyze spatial data and to visualize cartographic data.</td></tr>
<tr><td>Course content</td><td colspan="9">• Providing an understanding of the basic skills necessary to work with GIS.
• Introducing students to software and techniques.
• Teaching spatial data visualization techniques along with introductory knowledge of effective cartography and additional software for the production of maps, models and other information graphics.
• Identifying and accessing publicly available data sets.
• Teaching the skills necessary to create GIS data through a variety of methods including those offered by global positioning system (GPS) technologies and remote sensing.</td></tr>
<tr><td>Teaching methods</td><td colspan="9">The GIS course includes 15 classes taking two teaching hours each, during which a selection of computer software will be successively discussed (QGIS; SagaGIS; Geomedia Professional, etc.). There are an introductory lecture and lab components for each class meeting.</td></tr>
<tr><td>Assessment method</td><td colspan="9">ERASMUS students are expected to design, research, and complete a final project by the end of the semester. The project is required to be a specific research question explored using GIS tools.</td></tr>
<tr><td>Symbol of learning outcome</td><td colspan="7">Learning outcomes</td><td colspan="2">Reference to the learning outcomes for the field of study</td></tr>
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LO1	knows the concepts of the subject, classifies data sources for the construction of numerical models	K_W11, K_W12, K_K01
LO2	provides principles for data collection, modeling and analysis	K_W12, K_U10
LO3	can effectively select data sources to solve spatial problems	K_U10
LO4	can use standard data models in spatial analysis	K_U10
LO5	systematizes spatial information, creates its own numerical data sets, analyzes the result	K_U10
LO6		
Symbol of learning outcome	**Methods of assessing the learning outcomes**	**Type of tuition during which the outcome is assessed**
LO1	assessment of work on a practical project	P
LO2	assessment of work on a practical project	P
LO3	assessment of work on a practical project	P
LO4	assessment of work on a practical project	P
LO5	assessment of work on a practical project	P
LO6		
Student workload (in hours)		**No. of hours**
Calculation	Participation in computer classes	2 x 15
	Preparation for the workshop	20
	Participation in consultations related to a project	2
	Implementation of project tasks (including preparation of a final project)	20
	TOTAL:	72

Quantitative indicators	**HOURS**	**No. of ECTS credits**
Student workload – activities that require direct teacher participation	32	2
Student workload – practical activities	52	3

Basic references	1. Geographical information systems: principles, techniques, management, and applications. Paul A Longley (ed.), 2005. 2. QGIS User Guide. https://www.qgis.org, 2019.
Supplementary references	1. Spatial analysis: modeling in a GIS environment. Paul A Longley; Michael Batty (ed.), 1996. 2. Cartography: visualization of spatial data. Menno-Jan Kraak, Ferjan Ormeling, 1996.

Organisational unit conducting the course	**Department of Agri-Food Engineering and Environmental Management**	**Date of issuing the programme**
Author of the programme	**Andrzej Kamocki, PhD Eng.**	**Nov. 25, 2019**

L – lecture, C – classes, LC – laboratory classes, P – project, SW – specialization workshop, FW - field work, S – seminar