

## COURSE SYLLABUS AND COURSE REQUIREMENTS

ACADEMIC YEAR 2022/23 2<sup>ND</sup> SEMESTER

<i>Course title</i>	<i>Geographic Information Systems 2.</i>
<i>Course Code</i>	MSB127ANEP
<i>Hours/Week: le/pr/lab</i>	1/0/1
<i>Credits</i>	2
<i>Degree Programme</i>	Civil Engineering BSc
<i>Study Mode</i>	Full time
<i>Requirements</i>	Mid-term grade
<i>Teaching Period</i>	spring
<i>Prerequisites</i>	Geographic Information Systems 1. (MSB126ANEP)
<i>Department(s)</i>	Civil Engineering
<i>Course Director</i>	
<i>Teaching Staff</i>	Béla GADÓ

## COURSE DESCRIPTION

This course gives further insights of a well-designed Geographical Information System (GIS). Students learn about the structure, management, and benefits of a GIS database. Working with SRTM raster elevation data, deriving height information. Modern data acquisition technologies are introduced. In the laboratory classes the students will be using the QGIS software extensively.

## SYLLABUS

### 1. GOALS AND OBJECTIVES

The aim of the course is to give both theoretical and practical overview of the significance, structure, usage, and development of a geographical information system. Towards that goal in this class, data will be collected with modern technologies, models will be created and analyzed for deducing further information. The students will develop useful skills in order to confidently create and manage a GIS database and analyze data.

### 2. COURSE CONTENT

#### TOPICS

#### LECTURE

1. *Structure of a well-designed GIS: the importance of different layers*
2. *Utility of a GIS database*
3. *GIS applications*
4. *Modern data acquisition technologies: photogrammetry, laser scanner, drone*

#### LABORATORY PRACTICE

1. *Complex spatial queries in QGIS*
2. *Working with raster height models: contour lines, volume calculation, Catchment area and runoff modeling*
3. *Network analysis, working with dynamic graphs*

## DETAILED SYLLABUS AND COURSE SCHEDULE

### LECTURE

week	Topic <i>Lectures are held on the <u>odd</u> weeks.</i>	Compulsory reading; page number (from ... to ...)	Required tasks (assignments, tests, etc.)	Completion date, due date
1.	Introduction			
2.	---			
3.	How does GIS work	[1.] p. 24-37		
4.	---			
5.	Information organized into layers	[1.] p. 38-41		
6.	---			
7.	Why Is GIS Unique, Top Benefits Of GIS	[1.] p. 42-44		
8.	---			
9.	--- ( <i>Spring break</i> )			
10.	--- ( <i>Easter Monday</i> )			
11.	GIS Applications	[1.] p. 45-57		
12.	---			
13.	--- ( <i>May 1<sup>st</sup></i> )			
14.	---			
15.	Theoretical test		Theoretical test	

### LABORATORY PRACTICE

week	Topic <i>Laboratory practices are held on the <u>even</u> weeks.</i>	Compulsory reading; page number (from ... to ...)	Required tasks (assignments, tests, etc.)	Completion date, due date
1.	---			
2.	Complex spatial queries	[2.]		
3.	---			
4.	Placement optimization	[2.]	Project homework	15 <sup>th</sup> week
5.	---			
6.	Contour lines from SRTM and volume calculation	[2.]		
7.	---			
8.	Catchment area and runoff modeling	[2.]		
9.	--- ( <i>Spring break</i> )			
10.	--- ( <i>Easter Monday</i> )			
11.	---			
12.	Network analysis	[2.]		
13.	--- ( <i>May 1<sup>st</sup></i> )			
14.	Graphical Model Builder	[2.]		
15.	---			

### 3. ASSESSMENT AND EVALUATION

#### ATTENDANCE

##### ***Method for monitoring attendance***

Attending is required all classes and will impact the grade (max. 10%). Unexcused absences will adversely affect the grade, and in case of absence from more than 30% of the total number of lessons will be grounds for failing the class. To be in class at the beginning time and stay until the scheduled end of the lesson is required, tardiness of more than 20 minutes will be counted as an absence. In the case of an illness or family emergency, the student must present a valid excuse, such as a doctor's note.

#### ASSESSMENT

There shall be one written test in the semester on the 15<sup>th</sup> week during lecture time.

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##### ***Course resulting in mid-term grade***

##### ***Mid-term assessments, performance evaluation and their ratio in the final grade***

In order to get a signature for this subject, the student must have an active attendance in the laboratory classes. The way to prove attendance and active participating is to upload the class files after each laboratory practice into the corresponding Teams Assignment slots. For the signature, an acceptable project homework must be created as well by the end of the 15<sup>th</sup> week. Furthermore, for the final course grade at least a pass grade is required from the written test.

Type	Assessment	Ratio in the final grade
Written test	max 20 points	40 %
Project homework	max 20 points	60 %

##### ***Opportunity and procedure for re-takes***

An in-time turned in project homework may be returned for corrections. The written test may be re-taken once on the 1<sup>st</sup> week of the examination period.

##### ***Grade calculation as a percentage***

*based on the aggregate performance according to the following table*

Course grade	Performance in %
excellent (5)	85 % ...
good (4)	70 % ... 85 %
satisfactory (3)	55 % ... 70 %
pass (2)	40 % ... 55 %
fail (1)	below 40 %

The lower limit given at each grade belongs to that grade.

### 4. SPECIFIED LITERATURE

#### COMPULSORY READING AND AVAILABILITY

[1.] Lecture notes: Geoinformatics (L. Aradi) available in the Teams group and on Witch-server

#### RECOMMENDED LITERATURE AND AVAILABILITY

[2.] QGIS documentation: <https://docs.qgis.org/3.22/en/docs/index.html#> (2023)