

COURSE SYLLABUS AND COURSE REQUIREMENTS

ACADEMIC YEAR 2023/24 1ST SEMESTER

<i>Course title</i>	<i>Geographic Information Systems</i>
<i>Course Code</i>	MSB126ANEP
<i>Hours/Week: le/pr/lab</i>	1/0/3
<i>Credits</i>	5
<i>Degree Programme</i>	Civil Engineering BSc
<i>Study Mode</i>	Full time
<i>Requirements</i>	Midterm grade
<i>Teaching Period</i>	autumn
<i>Prerequisites</i>	Geodesy
<i>Department(s)</i>	Civil Engineering
<i>Course Director</i>	Béla GADÓ
<i>Teaching Staff</i>	

COURSE DESCRIPTION

In this course the students will get an in-depth insight into a well-designed Geographical Information System (GIS). Students will learn about collecting, managing, analysing, and presenting vector and raster data. To this end in the laboratory practical classes the industry standard QGIS program will be used extensively. Students will learn how to capture, manipulate, analyse, and present vector and raster data in QGIS on a compelling way.

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 (GIS). Towards that goal, data will be collected with modern technologies, models will be created and analysed for deducing further information. Students will develop useful skills to confidently create and manage a GIS database, analyse data and to present their results.

2. COURSE CONTENT

TOPICS

LECTURE	TOPICS
	<ol style="list-style-type: none">1. <i>Basic elements of information systems</i>2. <i>Modelling of the real world</i>3. <i>Types of data</i>4. <i>Reference systems</i>5. <i>Data sources</i>
LABORATORY PRACTICE	<ol style="list-style-type: none">1. <i>QGIS basics</i>2. <i>Reference systems and layers</i>3. <i>Basics of digitizing</i>4. <i>Attribute tables, calculated fields</i>5. <i>Spatial queries</i>6. <i>Elevation models from SRTM data</i>7. <i>Graphical Model Builder</i>

DETAILED SYLLABUS AND COURSE SCHEDULE

LECTURE

week	Topic	Compulsory reading	Required tasks (assignments, tests, etc.)	Completion date, due date
1.	Introduction. Development of information systems.	[1.]		
2.	---			
3.	Reference systems	[1.]		
4.	---			
5.	Data structures	[1.]		
6.	---			
7.	Information organized into layers	[1.]		
8.	---			
9.	Top Benefits Of GIS	[1.]		
10.	---			
11.	GIS Applications	[1.]		
12.	---			
13.	Theoretical TEST		Theoretical TEST	Nov. 27 th

PRACTICE, LABORATORY PRACTICE

week	Topic	Compulsory reading	Required tasks	Completion date, due date
1.	QGIS basics, Coordinate Reference Systems, creating layers	[2.], [3.]		
2.	The GeoPackage. Digitizing basics.	[2.], [3.]		
3.	Understanding symbol layers	[2.], [3.]		
4.	Labels and complex symbology. Calculated fields in the attribute table.	[2.], [3.]		
5.	Voronoi-polygons and simple spatial queries: buffer zones and layer intersections	[2.], [3.]		
6.	Complex spatial queries, selecting with filters. Placement optimization.	[2.], [3.]	1 st practical HW	Nov. 1 st
7.	Location-allocation analysis	[2.], [3.]		
8.	Contour lines from SRTM data	[2.], [3.]		
9.	Catchment area and runoff modelling, Network analysis	[2.], [3.]	2 nd practical HW	Dec. 2 nd
10.	Midterm project: importing and managing measured data	[2.], [3.]	Midterm project	Dec. 2 nd
11.	Midterm project: implementation of spatial queries	[2.], [3.]		
12.	Midterm project: print layout view	[2.], [3.]		
13.	Graphical Model Builder	[2.], [3.]	Practical TEST	Nov. 28 th

3. ASSESSMENT AND EVALUATION

ATTENDANCE

In accordance with the Code of Studies and Examinations of the University of Pécs, Article 45 (2) and Annex 9. (Article 3) a student may be refused a grade or qualification in the given full-time course if the number of class absences exceeds 30% of the contact hours stipulated in the course description. **Tardiness more than 20 minutes is considered as an absence!** Online participation is not allowed nor for the lectures, nor for the practical laboratory classes.

Method for monitoring attendance

Lectures: attendance sheets may be signed during the lectures.

Laboratory practices: at the end of every class, students will have to send their completed class materials as a sign of active presence.

ASSESSMENT

- There will be one *mandatory* **theoretical test** on the last lecture. The test will have only one re-take. The minimum requirement for the theoretical test is 40%.
- There will be one *mandatory* **midterm project assignment**. The minimum requirement for the project is 40%.
- There will be one *mandatory* **practical test** on the final laboratory class. The minimum requirement for the practical test is 40%.
- There will be two *optional* **practical homework**.
- *As can be seen from the above mentioned, performing only 40% on the mandatory parts (theoretical test, midterm project and practical test) is not enough for completing the class. Therefore, it is highly recommended to complete both practical homework before the due date!*

Course resulting in Midterm grade (PTE TVSz 40§(3))

Midterm assessments, performance evaluation and their ratio in the final grade

Type	Assessment	Ratio in the final grade
Theoretical test	max 40 points	30 %
Midterm project assignment	max 20 points	30 %
Practical test	max 20 points	20 %
2 Homework	max 10+10 points	10 % + 10%

Opportunity and procedure for re-takes (PTE TVSz 47§(4))

The mandatory assignments (theoretical test, midterm project assignment and practical test) can be repeated only once. The best score will be taken into consideration for calculating the final grade.

Grade calculation as a percentage

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 Syllabus (B. Gadó) available in the Teams group and on Witch-server

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