COURSE SYLLABUS AND COURSE REQUIREMENTS
ACADEMIC YEAR 2024/25 1ST SEMESTER

Course title	*Geographic Information Systems*
Course Code	MSB117ANEP
Hours/Week: le/pr/lab	1/0/3
Credits	5
Degree Programme	Civil Engineering BSc
Study Mode	*Full time*
Requirements	*Midterm grade*
Teaching Period	autumn
Prerequisites	Geodesy
Department(s)	Civil Engineering
Course Director	Béla GADÓ
Teaching Staff	

COURSE DESCRIPTION

In this course the students will get an in-depth insight into a well-designed Geographical Information System (GIS). Students will learn abought 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 deducting 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	1. *Basic elements of information systems* 2. *Modelling of the real world* 3. *Types of data* 4. *Reference systems* 5. *Data sources*
LABORATORY PRACTICE	1. *QGIS basics* 2. *Reference systems and layers* 3. *Basics of digitizing* 4. *Attribute tables, calculated fields* 5. *Spatial queries* 6. *Elevation models from SRTM data* 7. *Graphical Model Builder*

DETAILED SYLLABUS AND COURSE SCHEDULE

LECTURE

week	Topic	Compulsory reading	Required tasks (assignments, tests, etc.)	Completion date, due date
1.	Development and basic elements of information systems. The concept and characteristics of spatial information systems. Characterization and modeling of the real world. Types and characteristics of data. Establishment of a database.	[1.]		
2.	---			
3.	Geometric data reference system. Data acquisition procedures and data sources.	[1.]		
4.	---			
5.	Data structures of spatial information systems. Technological background of spatial information systems.	[1.]		
6.	---			
7.	How does GIS work? Information organized into layers.	[1.]		
8.	---			
9.	--- (autumn break)	[1.]		
10.	---			
11.	Why Is GIS Unique, Top Benefits Of GIS. GIS Applications.	[1.]		
12.	---			
13.	Theoretical test		Theoretical TEST	Nov. 25th
14.	---			

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.]	1st practical HW	Okt. 31st
7.	Location-allocation analysis	[2.], [3.]		
8.	Contour lines from SRTM data	[2.], [3.]		
9.	Catchment area and runoff modelling, Network analysis	[2.], [3.]	2nd practical HW	Dec. 7th
10.	Midterm project: importing and managing measured data	[2.], [3.]	Midterm project	Dec. 7th
11.	Midterm project: implementation of spatial queries	[2.], [3.]		
12.	Midterm project: print layout view	[2.], [3.]		
13.	Graphical Model Builder	[2.], [3.]		
14.	Motion detection	[2.], [3.]	Practical TEST	Dec. 3rd

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 is 40%.
- There will be one mandatory *__practical__ test* on the final laboratory class. The test will have only one re-take. The minimum requirement is 40%.
- There will be one mandatory **midterm project assignment**. The minimum requirement is 40%.
- There will be two mandatory **practical homework**. The minimum requirement is 40%.

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	40 %
Midterm project assignment	max 20 points	20 %
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)