

Course Syllabus

1	Course title	Geographical Information Systems (GIS)
2	Course number	1902459
3	Credit hours	٣
	Contact hours (theory, practical)	٣
4	Prerequisites/corequisites	N/A
5	Program title	Computer Information Systems
6	Program code	٢
7	Awarding institution	The university of Jordan
8	School	King Abdullah II School for Information Technology
9	Department	Computer Information Systems
10	Level of course	Bachelor's degree
11	Year of study and semester (s)	4 th Year
12	Final Qualification	Bachelor of Science in Computer Information Systems
13	Other department (s) involved in teaching the course	None
14	Language of Instruction	English
15	Teaching methodology	In Lab
16	Electronic platform(s)	<input checked="" type="checkbox"/> Moodle <input checked="" type="checkbox"/> Microsoft Teams <input checked="" type="checkbox"/> Others: LMSsystem
17	Date of production/revision	(10/10/2023)

18 Course Coordinator:

Name: Dr. Moh'd Belal Al- Zoubi
Office number: 211
Phone number: 22615
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19 Other instructors:

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٢٠ Course Description:

The purpose of this course is to introduce the concept of Geographic Information Systems (GIS). This includes what can GIS do?, spatial data, GIS data structure, raster versus vector data, topology and spatial relationships, data acquisition, entry, and quality. In addition this course outlines geographic database and inventory operations, basic geographic data analysis, and geographic systems output. The course will also include practical demonstrations on using the state-of-the art GIS software package ESRI's ArcGIS.

٢١ Course aims and outcomes:

Aims:

The aim of this course is to equip students with knowledge and skills on how GIS work, operate and used and to get benefits of the GIS. The course will also include practical demonstrations on using the state-of-the-art GIS software package ESRI's ArcGIS.

The main objectives of course are:

1. Understand GIS concepts.
2. Understand the GIS components.
3. Understand georeferencing and coordinate systems.
4. Understand GIS errors and how to handle them.
5. Understand GIS models and the role of each.
6. Understand Map making.
7. Understand remote sensing concepts and applications
8. Learn the ESRI ArcGIS tools.

Intended Learning Outcomes (ILOs): Upon successful completion of this course, students will be able to...

A- Knowledge and Understanding:

A1) Knowing what modules are included in a GIS and its basic operations including input output and processing.

A2) Understand the different applications of GISs.

A3) Know the different kinds of geographic data types.

A4) Understand different kinds of geographic data structures.

A5) Understand the concepts of GIS themes and GIS topology.

A6) Know GIS data entry processes and different kinds of input/output devices.

A7) Understand Data quality and management: Errors, accuracy, precision and scale.

A8) Understand georeferencing and coordinate systems.

A9) Know basic analysis operations and quality metrics applied on digital geographic data.

A10) Understand the different geographic models and the types of digital maps.

A11) Use ESRI's ArcGIS to implement GISs for different applications.

B-Intellectual skills-with ability to

B1) Distinguish between GISs and other information systems

B2) Distinguish between different digital maps data structures including raster and vector

B3) Apply and implement a GIS topology

B4) Use ESRI's ArcView to implement GISs for different applications and inventory operations

B5) Input, analyze and output geographic digital data

C- Practical Skills-With ability to

C1) Use different methods to create a GIS for a specific real world application.

C2) Verify the quality of the geographic data including tabular and maps.

C3) Advise on the most suitable type of digital maps to use for a specific application

C4) Improve the quality of geographic data used in a project

D- Transferable Skills-With ability to

D1) Plan for a GIS project including the needed data types

D2) Manage the needed resources for a GIS project

D3) Communicate with different external stake holders to deliver a reliable GIS

D4) Build professional GISs

ABET Students Outcomes (SOs):

- 1- Understand the role of GIS in today's environments.**
- 2- Recognize different types and data structures in GIS.**
- 3- Understand the concepts of GIS themes and GIS topology.**
- 4- Understand georeferencing and coordinate systems**
- 5- Design, implement GIS projects.**

Mapping ILOs to ABET SOs

ILOs	ABET SOs
A1, A2, B1, C1, D1	1
A4, B2, D1	2
A5, B3, C2	2
A8	4
A1, A2, B1, C1, D1	1
A4, B2, D1	2

22. Topic Outline and Schedule:

Week	Topic	ILOs	Teaching Methods* / Platform	Evaluation Methods	References
Week 1	Introduction to GIS, History and Applications	A1, A2, B1, D2	Online via (MS-Teams)	In-lecture discussion & questions	PPT slides on MS-Teams
Week 2	GIS Components and Infrastructure	A1, A2, B1, D2	Online via (MS-Teams)	In-lecture discussion & questions	PPT slides on MS-Teams

Week	Topic	ILOs	Teaching Methods* / Platform	Evaluation Methods	References
Week 3 & 4 & 5	GIS Data Structures <ul style="list-style-type: none"> • Raster Structure • vector structure • Pros & Cons • Introduction to Topology 	A4, B2, C3	Online via (MS-Teams)	In-lecture discussion & questions	PPT slides on MS-Teams
Week 6	Representing Geography <ul style="list-style-type: none"> • Digital Representation • Digital Maps • Analog Representation • ArcGIS maps 	A4, B2, C3	Online via (MS-Teams)	In-lecture discussion & questions	PPT slides on MS-Teams
Week 7 & 8	Geo-Referencing <ul style="list-style-type: none"> • Latitude and Longitude • Projection and Coordinates • UTM Projection • Web Mercator Mid Term Exam	A5, B4	Online via (MS-Teams)	In-lecture discussion & questions	PPT slides on MS-Teams
Week 9	Remote Sensing <ul style="list-style-type: none"> • Introduction • Passive & Active Sensors • Remote sensing platforms • Remote Sensing pros and cons 	A4, B2, C3	Online via (MS-Teams)	In-lecture discussion & questions	PPT slides on MS-Teams
Week 10	Geo Modeling <ul style="list-style-type: none"> • Modeling • Modeling levels • Raster & Vector • TIN modeling 	A9, B5, C4	Online via (MS-Teams)	In-lecture discussion & questions	PPT slides on MS-Teams
Week 11	Midterm Exam				
Week 12	Spatial Analyses <ul style="list-style-type: none"> • Data Visualization1 • Data Visualization2 • Analysis Methods • Buffers 	A9, A10, B5, C4	Online via (MS-Teams)	In-lecture discussion & questions	PPT slides on MS-Teams
Week 13 & 14	GIS coding using ArcGIS	A11, B4	Online via (MS-Teams)	In-lecture discussion & questions	PPT slides on MS-Teams

Week	Topic	ILOs	Teaching Methods* / Platform	Evaluation Methods	References
Week 15	Students Presentations		Online via (MS-Teams)	In-lecture discussion & questions	
Week 16 Final Exam					

¶4 Evaluation:

Midterm Exam: 30 %
 Project: 20%
 Final Exam: 30%

¶5 Course Requirements (e.g: students should have a computer, internet connection, webcam, account on a specific software/platform...etc):

Laptop or Desktop with Internet connectivity.
 Every student should visit the following site for course material, handouts and announcements.
 -Site address: elearning.ju.edu.jo
 -User name: Your university internet id
 -Password: Your university internet password

¶6 Course Policies:

A- Attendance policies:

- According to University regulations the maximum allowable absence 15% of number of lectures/semester

B- Absences from exams and submitting assignments on time:

- Every student is expected to completely adhere to the assignments and report strict deadlines, absolutely no exceptions will be given.

- Concerns or complaints should be expressed in the first instance to the module lecturer; if no resolution is forthcoming then the issue should be brought to the attention of the module coordinator (for multiple sections) who will take the concerns to the module representative meeting. Thereafter problems are dealt with by the Department Chair and if still unresolved the Dean and then ultimately the Vice resident. For the final complaints, there will be a committee to review grading the final exam.

C- Health and safety procedures:

- University regulations.

D- Honesty policy regarding cheating, plagiarism, misbehavior:

The honor code applies to all work turned in for this course including exams and assignments. It is important that you understand the solutions to all problems, and the best way to gain an understanding is to work them out and write them up by yourself. Hence the policy is that you must submit your own work. You may not share your work with other students, unless it is allowed as group. Violating the policy will be taken as a no submission state for the assignment. University regulations will be preserved at all times.

E- Grading policy:

0-40	F	41-49	D-	50-55	D	56-60	D+		
61-65	C-	66-71	C	72-76	C+				
77-80	B-	81-83	B	84-86	B+	87-89	A-	90-100	A

F- Available university services that support achievement in the course:

For more details on University regulations please visit <http://www.ju.edu.jo/Pages/Regulations.aspx>.

7 References:

A- Textbook

Geographic Information Systems and Science, Paul A. Longley, Michael F. Goodchild, David J. Maguire, David W. Rhind, fourth Edition, John Wiley and Sons, 2017.

B- Recommended books, materials, and media:

C- GIS: A Visual Approach, Bruce E. Davis , , second Edition, Onword press, 2002.

D- ArcGIS 10.x Documentation, ArcGIS ESRI. www.esri.com.

E- ArcGIS API for Java Script : <https://developers.arcgis.com/javascript/>

F- International Journal of Geographic Information Systems - <https://www.tandfonline.com/loi/tgis20>

G- Online materials, and media:

Students are encouraged to make heavy use of the library, E-LIBRARY <http://ezlibrary.ju.edu.jo/login> or from within the university using (<http://e-library>)

Online Course Site

Every student should visit the following site for course material, handouts and announcements.

Site address: elearning.ju.edu.jo

User name: Your university internet id

Password: Your university internet password

8 Additional information:

Course description, Teaching materials, Assignments and Announcements are available in the course page on <http://elearning.ju.edu.jo>

Name of Course Coordinator: -----**Dr. Dr. Moh'd Belal Al Zoubi** ----- Signature: ----*Dr. Moh'd Belal Al Zoubi* ---- Date: -----10/02/2023-----

Head of Curriculum Committee/Department: ----- Signature: -----

Head of Department: ----- Signature: -----

Head of Curriculum Committee/Faculty: ----- Signature: -----

Dean: ----- Signature: -----
