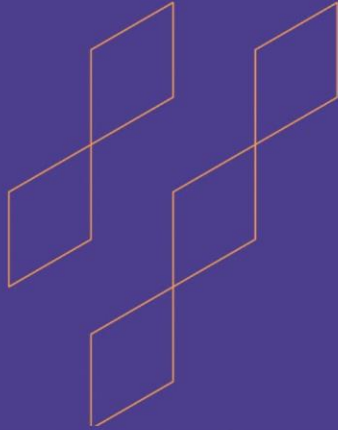




Course Specification

(Postgraduate Programs)

Course Title:	GIS Applications
Course Code:	GIS5004
Program:	Higher Diploma in Geographic Information System
Department:	Geography
College:	Social Science
Institution:	Umm Al-Qura University
Version:	V1
Last Revision Date:	7 December 2024

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A. General information about the course:

1. Course Identification:

1. Credit hours: (3 Credit hours)

2. Course type

A. ☐ University ☐ College ☒ Department ☐ Track
B. ☒ Required ☐ Elective

3. Level/year at which this course is offered:(Level 2/First year)

4. Course General Description:

The Geographic Information Systems (GIS) Applications course provides an in-depth understanding of the advanced applications of GIS technology in solving real-world geographical, environmental, and spatial problems. This course covers various application areas where GIS is used to manage, analyze, and interpret spatial data in different disciplines, including urban planning, environmental management, agriculture, transportation, and disaster management.

The students will develop critical thinking and problem-solving skills, preparing them to take on roles where they can leverage GIS technology to support decision-making processes and policy development in various sectors.

5. Pre-requirements for this course (if any):

N/A

6. Pre-requirements for this course (if any):

N/A

7. Course Main Objective(s):

By the end of the course, students will be able to:

1. Understand the advanced applications of GIS in various industries such as urban planning, environmental management, agriculture, and disaster response.
2. Demonstrate proficiency in using GIS software tools for spatial data management, analysis, and visualization
3. Apply GIS techniques to solve real-world geographic and spatial problems, including spatial analysis, modeling, and decision-making.

4. Evaluate and select appropriate GIS tools and methodologies for specific applications based on the needs of the project or problem at hand.
5. Analyze spatial data and generate reports, maps, and other visual outputs to communicate GIS findings effectively.
6. Implement GIS-based solutions that support decision-making processes in government, business, and environmental sectors.

2. Teaching Mode: (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	75	100%
2	E-learning		
3	Hybrid - Traditional classroom - E-learning		
4	Distance learning		

3. Contact Hours: (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	30
2.	Laboratory/Studio	45
3.	Field	
4.	Tutorial	
5.	Others (specify).....	
	Total	75

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods:

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	To identify the key of GIS applications across various industries such as urban planning, environmental	K1	-Lectures. - Discussion and Critical Thinking.	- Oral and written exams. - Exercises and assignments

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
	management, agriculture.		-Practical training.	-Class Participation and Discussion
1.2	To understand the principles used in GIS to solve spatial problems and to make informed decisions.	K2	-Exercises.	
1.3	To explain the different types of GIS tools and techniques available for spatial data analysis, and modeling.	K3		
2.0	Skills			
2.1	To demonstrate proficiency in using GIS software tools for data acquisition, spatial analysis of geographic information.	S1	- Interactive Learning -Lectures. -Practical training. -Exercises.	-Written exams. - Presentation and Reporting
2.2	To analyze spatial data to solve complex geographic problems in various application domains.	S2		
2.3	To apply GIS techniques for real-world projects, including data collection, processing, analysis, and the presentation of spatial information.	S3		
3.0	Values, autonomy, and responsibility			
3.1	To collaborate with peers to exchange knowledge and work effectively in team-based GIS projects.	V1	- Discussion and Critical Thinking. -Practical training.	- Oral and written exams. -Final Project or Case Study
3.2	To demonstrate awareness of ethical	V2	-Exercises.	





Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
	considerations in GIS applications, including data privacy, accuracy, and responsible data use		-Group Projects and Case Studies	
3.3	To contribute meaningfully to group discussions and projects by providing insights, ideas, and supporting team goals.	V3		

C. Course Content:

No	List of Topics	Contact Hours
1.	Introduction to GIS Applications	5
2.	GIS Data Acquisition and Management	10
3.	Spatial Analysis Techniques	15
4.	GIS Applications in Urban Planning	5
5.	GIS in Environmental Management	5
6.	GIS in Agriculture and Land Management	5
7.	GIS for Disaster Management and Emergency Response	5
8.	GIS in Public Health and Social Science Applications	5
9.	GIS in Transportation and Logistics	5
10.	Final Project or Case Study	15
Total		75

D. Students Assessment Activities:

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Weekly evaluation (oral discussions and questions)	every lecture	5%
2.	Continuous assessment: (periodic or short tests "quizzes, essay, report)	3rd + 5th + 8th week.	10%
3.	middle-term exam	the sixth week	20%





No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
4.	Final Project	Eleventh week.	15%
5.	The final test.	Thirteenth week	50%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.)

E. Learning Resources and Facilities:

1. References and Learning Resources:

Essential References	Longley, P. A., Goodchild, M. F., Maguire, D. J., & Rhind, D. W. (2015). <i>Geographic Information Systems and Science</i> (4th ed.). Wiley.
Supportive References	Chang, K.-T. (2016). <i>Introduction to Geographic Information Systems</i> (8th ed.). McGraw-Hill Education.
Electronic Materials	International Journal of Geographic Information Science https://www.tandfonline.com/toc/tgis20/current Journal of Spatial Science https://www.tandfonline.com/journals/tjss20 Remote Sensing of Environment https://www.sciencedirect.com/journal/remote-sensing-of-environment
Other Learning Materials	OpenStreetMap: No DOI; it's a collaborative mapping project that's open-source: https://www.openstreetmap.org/

2. Educational and Research Facilities and Equipment Required:

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classrooms. Lab. showroom.
Technology equipment (Projector, smart board, software)	Data display tools Smart board
Other equipment (Depending on the nature of the specialty)	A classroom dedicated to students to complete practical tasks within the Geography Library.



F. Assessment of Course Quality:

Assessment Areas/Issues	Assessor	Assessment Methods
Teaching Process	Faculty members from the department and the head of the department	Review the midterm and final exams and prepare a form on the extent to which the course exam meets the exam standards.
Effective Methods of Assessing Students	Faculty members from the department and the head of the department	Reviewing the correction of a sample of midterm and final exam papers. Preparing a form for correcting a random sample of students' answers to the course exams.
Teaching Effectiveness	Male and female students	Electronic questionnaire on the university website
Teaching Development	Faculty members & program leaders & peer programs	Review the midterm and final exams and prepare a form on the extent to which the course exam meets the exam standards. Conducting workshops and cinemas to discuss the teaching process for a course • Discussing the teaching process during periodic meetings such as department councils • Conducting periodic maintenance of laboratories, programs and various teaching aids Review the feedback from the students to rectify weaknesses
Student Achievement Standards	Independent faculty members & faculty members from other institutions	Checking and reviewing a sample of students' work by a special committee from the department. • Exchange periodically to correct the tests with teaching staff from another institution. Participation and exchange in correction and revision among colleagues who study the same course.



Assessment Areas/Issues	Assessor	Assessment Methods
Course Effectiveness	Department faculty members & graduate students & employers	Checking and reviewing a sample of students' work by a special committee from the department. • Exchange periodically to correct the tests with teaching staff from another institution. Participation and exchange in correction and revision among colleagues who study the same course.

Assessor (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

Assessment Methods (Direct, Indirect)

G. Specification Approval Data:

COUNCIL /COMMITTEE	
REFERENCE NO.	
DATE	

