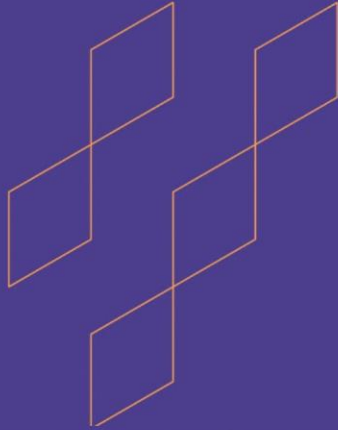




Course Specification

(Postgraduate Programs)

Course Title:	Remote Sensing
Course Code:	GIS5001
Program:	Higher Diploma in Geographic Information System
Department:	Geography
College:	College of Social Sciences
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)

(3 credit hours)

2. Course type

A. ☐ University ☐ College ☒ Department ☐ Track

B. ☒ Required ☐ Elective

3. Level/year at which this course is offered: ((Level 1 / First year))

4. Course General Description:

Remote sensing is an important scientific technique for environmental monitoring and management. It is used for global and local change studies. This course introduces and develops student understanding and skill at deploying remote sensing information extraction techniques to provide information about human and physical environments. that are increasingly used by decision makers. This course examines the principles and application of remote sensing to a range of disciplines. Principles include the interaction of electromagnetic radiation with the Earth's atmosphere and surface, spectral characteristics of earth surface materials, and the nature of imagery collected by a variety of earth-observation sensors. These data are relevant to a wide range of applications including geology, environmental and agricultural science.

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):

- To know Principles of Remote Sensing and understand the current remote sensing system.
- To Learn how multispectral digital sensors work and their uses
- Knowing the types and components of remote sensing systems, and explaining the role of electromagnetic spectra in exploring ground targets.
- The ability to distinguish between types of sensor data, methods and techniques of obtaining them, and trained to interpret satellite images.
- To deal with main applications of remote sensing in various fields
- Understanding the role of remote sensing technology in planning processes and achieving comprehensive and sustainable development in the Kingdom of Saudi Arabia.

2. Teaching Mode: (mark all that apply)



No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	45	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	45
2.	Laboratory/Studio	
3.	Field	
4.	Tutorial	
5.	Others (specify).....	
	Total	45

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	The student will be familiar with the basic concepts of remote sensing and its development.	K1	- Lectures - Conducting discussions	Eexams. Homework
1.2	The student will identify the elements and components of remote sensing.	K1	- Lectures - Brainstorming	Eexams. Homework
1.3	The student will explain the most important types of remote sensing systems and their methods of operation.	K2	- Lectures - Role Exchange	Eexams. Homework





Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
2.0	Skills			
2.1	The student will distinguish between types of remote sensing systems.	S1	• Lectures • Presentations	Eexams. Homework
2.2	The student will discover remote sensing applications.	S1	• Seminar • Discussion and Dialogue • Brainstorming	Writing a report on remote sensing applications
2.3	The student will analyze the spectral response of different components of the Earth's surface.	S2	• Seminar • Discussion and Dialogue • Brainstorming	Eexams. Homework
3.0	Values, autonomy, and responsibility			
3.1	The student will discuss the differences between the interaction of electromagnetic energy with the atmosphere and with the materials of the Earth's surface.	V1	Discussion dialogue and training in the lecture on creative thinking	Homework
3.2	The student will participate with his colleagues in conducting a project on geographical remote sensing applications.	V2	Directing students to paper and digital libraries and websites to obtain books, research, and articles that dealt with satellites.	Homework

C. Course Content:

No	List of Topics	Contact Hours
1.	Definition of remote sensing, its importance, the difference between remote sensing and aerial photography, and the advantages of remote sensing information.	4
2	Historical development of remote sensing systems and processes - (Historical overview)	4
3	Basic elements of a remote sensing system (components of a remote sensing program) include electromagnetic energy, electromagnetic spectrum, and the spectrum range of waves. Electromagnetism is used in remote sensing.	4
4	Interaction of electromagnetic energy with components of the atmosphere	4



5	Interaction of electromagnetic energy with materials of the Earth's surface	4
6	Spectral response of materials of the Earth's surface (spectral reflectance properties of soil, water, and plants)	4
7	Structure of digital images of satellite data	5
8	Types of survey systems, satellites, their receivers, and their spectral and spatial characteristics	6
9	Methods of obtaining satellite images and the programs used for them.	4
10	Remote Sensing applications (in Earth sciences - agriculture and forestry - environmental impact assessment and risk assessment - water resources management - urban & regional planning)	6
Total		45

D. Students Assessment Activities:

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Assignments and Reports	All	20%
2.	Presentations	4/6	5%
3.	Mid-term exam	7	20%
4.	Final project	14	5%
4	Final Exam	16 /17	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	Wissam El-Din Muhammad Abdo (2013): Introduction to Remote Sensing and its Applications - First Edition - Publisher: Al-Mutanabbi Library, ISBN: 978-603-8093-53-5
Supportive References	Floyd F. Sabins, James M. Ellis, 2020. Remote Sensing: Principles, Interpretation, and Applications, Fourth Edition. Waveland Press, Incorporated 526p Lillesand, T., Kiefer, R. W., & Chipman, J. (2014). Remote Sensing and Image Interpretation. John Wiley & Sons. James B. Campbell , and Randolph H. Wynne, (2011): Introduction to Remote Sensing, Fifth Edition 5th ,Guilford press, New York, USA Rees, W. G. (2012). Physical Principles of Remote Sensing. Cambridge University Press. Jensen, J. R. (2009). Remote Sensing of The Environment: An Earth Resource Perspective 2/E. Pearson Education India. Sabins, F. F. (2007). Remote Sensing: Principles and Applications. Waveland Press



Electronic Materials	• Saudi Digital Library • King Abdullah Digital library • Academia.com • ResearchGate • Google Scholars
Other Learning Materials	http://www.csun.edu/~hmc60533/CSUN_407_690D/S2008_exercises http://landsathandbook.gsfc.nasa.gov/handbook.html http://landsat.gsfc.nasa.gov/ http://www.fas.org/irp/imint/docs/rst/Intro/Part2_15.html http://geoinfo.amu.edu.pl/wpk/rst/rst/Front/tofc.html http://www.ccrs.nrcan.gc.ca/resource/tutor/fundam/index_e.php http://www.satimagingcorp.com/gallery.html http://eoedu.belspo.be/en/satellites/

2. Educational and Research Facilities and Equipment Required:

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classrooms for lectures and exams for students during the scheduled class hours.
Technology equipment (Projector, smart board, software)	Data show for some work presentation. Smart board
Other equipment (Depending on the nature of the specialty)	A classroom dedicated to students to complete practical tasks

F. Assessment of Course Quality:

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Faculty members who teach this course and the lab staff associated with the course.	Both written and verbal, through presentations. Analysis of students' marks Regular feedback of the students about the course and the teaching methods
Effectiveness of students' assessment	Faculty members who teach this course and those teaching other courses relevant to this course.	Regular revising and improving of the course contents and consulting the faculty member





Assessment Areas/Issues	Assessor	Assessment Methods
		Teaching faculty and lab staff associated with the course are also available for personal consultation.
Quality of learning resources	Faculty members who teach this course	Frequent improvement for teaching and learning techniques. Frequent survey for latest references. Encouraging the students in team work cooperation and writing reports.
The extent to which CLOs have been achieved	Independent teaching staff member(s)	A sample of students answer sheets is revised by a specified committee of the department.
Other		

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

Assessment Methods (Direct, Indirect)

G. Specification Approval Data:

COUNCIL /COMMITTEE	
REFERENCE NO.	
DATE	

