



Course Specification

— (Postgraduate Programs) عبدالمحسن بن عبدالعزيز

Course Title: Environmental Remote Sensing

Course Code: BIO-6320

Program: Master of Science in Applied Biology (Biodiversity, Wildlife Conservation & Management)

Department: Biology عبدالمحسن بن عبدالعزيز

College: Science

Institution: Imam Mohammad Ibn Saud Islamic University

Version: 1

Last Revision Date: Pick Revision Date.

عبدالمحسن بن عبدالعزيز



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A. General information about the course:

1. Course Identification:

1. Credit hours: 3 (Lecture 2+ Lab 2)

2. Course type

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

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

4. Course general Description:

This graduate course focuses on the nature of digital remote sensing data basic of satellite orbits, remote sensing data acquisition system, georeferencing and orthorectification, radiometric normalization and corrections, image display and visualization, image enhancement, image transformation, image segmentation and classification, hyperspectral image and LiDAR data analysis and digital change detection.

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

Biodiversity Studies and Applied Ecology

6. Co-requisites for this course (if any):

7. Course Main Objective(s):

The objective of this course concerned on the principles and techniques for processing and analyzing remotely sensed data in natural resource inventory and analysis.

2. Teaching Mode: (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom		100%
2	E-learning		



No	Mode of Instruction	Contact Hours	Percentage
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	30
3.	Field	
4.	Tutorial	
5.	Others (specify)	
	Total	60

B. Course Learning Outcomes, Teaching Strategies, Assessment Methods

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Outline the basic concepts and terminology related to use and analysis of remotely sensed spatial data.	1.1	Two credits weekly lectures	-Quizzes -Presentations -Assignments -written exams
1.2	Recognize data limitation and application of appropriate analyses for interpretation and use remotely sensed data.	1.2	Two credits weekly lectures	Quizzes -Presentations -Assignments -written exams

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
2.0	Skills			
2.1	Evaluate the fundamental concepts and interpretive skill to use remote sensing and image analysis tools in natural resources research and management	2.1	-Two credits weekly lectures -Tutorials	-Presentations -Assignments -written exams
2.2	Interpret principles and concepts necessary to pursue further studies in digital image processing of remotely sensed data.	2.2	-Two credits weekly lectures -Tutorials	-Presentations -Assignments -written exams
3.0	Values, autonomy, and responsibility			
3.1	Ability to work and communicate effectively in groups	3.1	Group discussions	-Presentations -Reports
3.2	Carry out assigned tasks limited responsibility	3.2	Group discussions	-Presentations -Reports

C. Course Content:

No	List of Topics	Contact Hours
1.	Introduction to ERDAS imaging and Georectification, Orthorectification	8
2.	Radiometric Enhancement, positional accuracy -Spatial enhancement	8
3.	Digitization – image classification	3
4.	Object oriented classification	3
5.	Assessing thematic accuracy	3
6.	Digital stereoscopy, introduction to KiDAR data analysis : Fuzion	3
7.	Project presentations	2
Total		30

D. Students Assessment Activities:

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Midterm exam-1	5 th week	20%
2.	Midterm exam-2	10 th week	20%
3.	Assignments, presentations, attendance, data search, participation	Throughout the course duration	20%
4.	Final exam	16 th week	40%

*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	Sabins Jr, F. F., & Ellis, J. M. (2020). <i>Remote sensing: Principles, interpretation, and applications</i> . Waveland Press, United States.
Supportive References	Weng, Q., & Qihao, W. (2013). Introduction to remote sensing systems, data, and applications. <i>Remote Sensing of Natural Resources</i> , 3-20. Taylor & Francis group, USA https://taylorandfrancis.com/
Electronic Materials	
Other Learning Materials	Lavender, Samantha, and Andrew Lavender. <i>Practical handbook of remote sensing</i> . CRC Press, 2023. USA. Uhttps://books.google.com.sa/books?hl=en&lr=&id=IHmxEAAAQBAJ&oi=fnd&pg=PP1&dq=Introduction+to+Remote+Sensing+FIFTH+EDITION&ots=8UoFfcmB3F&sig=zaINCOdF002jrljN9ikTi2JEtgk&redir_esc=y#v=onepage&q&f=false

2. Educational and Research Facilities and Equipment Required:

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom
Technology equipment (Projector, smart board, software)	Projector, smart board
Other equipment (Depending on the nature of the specialty)	



F. Assessment of Course Quality:

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Indirect
Effectiveness of students assessment	Faculty	Direct
Quality of learning resources	Faculty	Direct
The extent to which CLOs have been achieved	Faculty	Direct
Other		

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

Assessment Methods (Direct, Indirect)

G. Specification Approval Data:

-	BIOLOGY DEPARTMENT COUNCIL
REFERENCE NO.	23
DATE	23/8/1445

