Course Description Form/ Remote Sensing

1. Course Name:
Remote Sensing
2. Course Code:
RESE352
3. Semester / Year:
Spring second semester/ 2023-2024
4. Description Preparation Date:
1/2/2024
5. Available Attendance Forms:
Life in person
6. Number of Credit Hours (Total) / Number of Units (Total)
2 + 3 / 3.5
7. Course administrator's name (mention all, if more than one name)
Name: Dr. khaled Anwer khaled Email: Khalid.anwar31@uomosul.edu.iq
8. Course Objectives
Course Objectives - Enable the student to understand what is related to remote sensitivity and its relationship to soil sciences and water resources - Enable the student to know the most important features of remote sensing - Enable the student to become familiar with the most important applications of remote sensing in other sciences - Empowering the student with the ability to detect space data - The student can interpret, process, and produce maps related to remote sensing - Enabling the student to become familiar with the most important laboratory methods In monitoring changes in vegetation cover and revealing the reversibility of every phenomenon on the surface of the earth
9. Teaching and Learning Strategies
- Interactive lecture - Brainstorming - Dialogue and discussion - Assigning tasks and reporting - Presentations of examples of sites degraded by erosion
10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2 virtual	A1: The student must be able to demonstrate sound knowledge and understanding of remote sensing	Lecture: Introduction to remote sensing	Interactive lecture, brainstorming, dialogue and	Semester exam 1, exam

		B1: He possesses practical and mental knowledge and concepts that help him in remote sensing		discussion, self-learning	
	3 Laboratory	A1: The student must be able to demonstrate sound knowledge and understanding of remote sensing C6: The student discovers any means of distinguishing between remote sensing vocabulary and is able to use laboratory tools within the specialty.	Concepts and foundations of remote sensing	Interactive lecture, brainstormin g, dialogue and discussion, self-learning	Semester exam 1, final exam
2	2 virtual	A2: The student explains the most important remote sensing processes B1: He possesses practical and mental knowledge and concepts that help him in the stages of remote sensitization.	Stages and processes of remote sensing	Interactive lecture, brainstormin g, dialogue and discussion, self-learning	Semester exam 1, final exam
	3 Laboratory	C6: The student discovers any means of distinguishing between remote sensing vocabulary and is able to use laboratory tools within the specialty	Aerial survey sources and information		Direct drawing
3	2 virtual	A2: The student explains the most important remote sensing processes	Properties of electromagneti c radiation		Semester exam 1, final exam
	3 Laboratory	C6: The student discovers any means of distinguishing between remote sensing vocabulary and is able to use laboratory tools within the specialty. B9: The student will be able to suggest methods for analyzing aerial photographs and data and interpreting agricultural phenomena	Types of aerial photographs and the differences between them		Field evaluation
4	2 virtual	A2: The student explains the most important remote sensing processes C6: The student discovers any means of distinguishing between remote sensing vocabulary and is able to use	Applications of remote sensing and the electromagneti c spectrum		Semester exam 1, final exam

		laboratory tools within the specialty. D1: The student will use computer programs to analyze and display data and information in the field of remote sensing			
	3 Laboratory	C6: The student discovers any means to distinguish between remote sensing vocabulary and is able to use laboratory tools within the specialty. C9: The student is able to carry out applied research, and use statistical programs in experimental design and data analysis	The coordinate system on aerial photographs and the distance between points	Interactive lecture, brainstormin g, dialogue and discussion, self-learning	Practical quiz 2, direct drawing
5	2 virtual	C6: The student discovers any means of distinguishing between remote sensing vocabulary and is able to use laboratory tools within the specialty. D1: The student will use computer programs to analyze and display data and information in the field of remote sensing	Characteristics of aerial photographs	Interactive lecture, brainstormin g, dialogue and discussion, self-learning	Semester exam 1, final exam
	3 Laboratory	C6: The student discovers any means of distinguishing between remote sensing vocabulary and is able to use laboratory tools within the specialty. D12: The student calculates any equation related to reflectivity, uses information technology to obtain data and information easily and conveniently.	finding ground coordinates	Interactive lecture, brainstormin g, dialogue and discussion, self-learning	Semester exam 1, final exam
6	2 virtual	A2: The student explains the most important remote sensing processes C6: The student discovers any means of distinguishing between remote sensing vocabulary and is able to use laboratory tools within the specialty. D1: The student will use computer programs to	Lecture: Spectral reflectance properties of soil, plants and water	Interactive lecture, brainstormin g, dialogue and discussion, self-learning	Semester exam 1, final exam

		analyze and display data and information in the field of remote sensing.			
	3 Laboratory	C9: The student should be able to analyze data related to satellites and use calculators and programs. D12: The student calculates any equation related to reflectivity, uses information technology to obtain data and information easily and conveniently.	Spectral bands and their ranges in satellites and reading reflectivity	Interactive lecture, brainstormin g, dialogue and discussion, self-learning	Direct drawing and homework
7	2 virtual	A1: The student must be able to demonstrate sound knowledge and understanding of remote sensing. C9: The student should be able to analyze data related to satellites and use calculators and programs.	Lecture: Study of space visuals	Interactive lecture, brainstormin g, dialogue and discussion, self-learning	Semester exam 2, final exam
	3 Laboratory	C9: The student should be able to analyze data related to satellites and use calculators and programs. D1: The student will use computer programs to analyze and display data and information in the field of remote sensing. E3: The student must deal efficiently and effectively in the field of work and practice the characteristics and features of satellites.	Black and white film and color film	Interactive lecture, brainstormin g, dialogue and discussion, self-learning	Field project
8	2 virtual	C6: The student discovers any means of distinguishing between remote sensing vocabulary and is able to use laboratory tools within the specialty. C9: The student should be able to analyze data related to satellites and use calculators and programs.	Spectral, radiological and temporal resolution	Interactive lecture, brainstormin g, dialogue and discussion, self-learning	Semester exam 2, final exam
	3 Laboratory	B18: The student should be able to analyze data and information in the land, water and environment	Engineering analysis of systems	Interactive lecture, brainstormin g, dialogue and	Direct drawing and homework

		sector to find the most appropriate solutions C6: The student discovers any means of distinguishing between remote sensing vocabulary and is able to use laboratory tools within the specialty.		discussion, self-learning	
9	2 virtual	A1: The student must be able to demonstrate sound knowledge and understanding of remote sensing. C9: The student should be able to analyze data related to satellites and use calculators and programs.	Elements of interpreting aerial photographs		Semester exam 2, final exam
	3 Laboratory	B18: The student should be able to analyze data and information in the land, water and environment sector to find the most appropriate solutions. D12: The student calculates any equation related to reflectivity, uses information technology to obtain data and information easily and conveniently.	Thermal aerial photography	Interactive lecture, brainstormin g, dialogue and discussion, self-learning	Direct drawing and homework
10	2 virtual	A2: The student explains the most important remote sensing processes C9: The student should be able to analyze data related to satellites and use calculators and programs.	Interpreting phenomena in images and visuals	Interactive lecture, brainstormin g, dialogue and discussion, self-learning	Semester test2
	3 Laboratory	C6: The student discovers any means of distinguishing between remote sensing vocabulary and is able to use laboratory tools within the specialty. D12: The student calculates any equation related to reflectivity, uses information technology to obtain data and information easily and conveniently.	Thermal energy detectors for monitoring the features of the Earth's surface	Interactive lecture, brainstormin g, dialogue and discussion, self-learning	Direct drawing and homework
11	2 virtual	A2: The student explains the most important remote sensing processes	Spectral and temporal	Interactive lecture, brainstormin	Final test

		C6: The student discovers any means of distinguishing between remote sensing vocabulary and is able to use laboratory tools within the specialty.	accuracy of satellites	g, dialogue and discussion, self-learning	
	3 Laboratory	B18: The student should be able to analyze data and information in the land, water and environment sector to find the most appropriate solutions. C9: The student should be able to analyze data related to satellites and use calculators and programs. C24: The student must be proficient in using modern technologies and managing machines, equipment, and geographic information systems.	Study of objective, optimized and processed satellite cartographer	Interactive lecture, brainstormin g, dialogue and discussion, self-learning	Direct drawing and homework
12	2 virtual	A2: The student explains the most important remote sensing processes B20: The student will be able to analyze the factors that have a mutual influence between water scarcity, desertification and climate change. C6: The student discovers any means of distinguishing between remote sensing vocabulary and is able to use laboratory tools within the specialty.	Defining the spatial resolution of satellite visualization and the capabilities of different sensors	Interactive lecture, brainstormin g, dialogue and discussion, self-learning	Final Test
	3 Laboratory	B18: The student should be able to analyze data and information in the land, water and environment sector to find the most appropriate solutions. B48: The student should be able to determine and measure land areas and conduct spatial analysis C9: The student should be able to analyze data related to satellites and use calculators and programs.	Multi-spectral scanner	Interactive lecture, brainstormin g, dialogue and discussion, self-learning	Direct drawing and homework

	2 virtual	A2: The student explains the most important remote sensing processes C9: The student should be able to analyze data related to satellites and use calculators and programs.	Types of satellite visuals according to spatial resolution and their classification according to accuracy	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Final Exam
13	3 Laboratory	B20: The student will be able to analyze the factors that have a mutual influence between water scarcity, desertification and climate change. B48: The student should be able to determine and measure land areas and conduct spatial analysis C9: The student should be able to analyze data related to satellites and use calculators and programs.	Using a calculator to differentiate between satellite data and interpret it	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Direct drawing and homework
	2 virtual	C6: The student discovers any means of distinguishing between remote sensing vocabulary and is able to use laboratory tools within the specialty. C9: The student should be able to analyze data related to satellites and use calculators and programs.	The radiological accuracy of sensors and their factors	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short test, final test
14	3 Laboratory	C9: The student should be able to analyze data related to satellites and use calculators and programs. C34: The student should monitor changes in natural phenomena, such as soil degradation, desertification, and water pollution, which lead to the death of beneficial organisms. D12: The student calculates any equation related to reflectivity, uses information technology to obtain data and information easily and conveniently.	Using remote sensing programs to study space data	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short practical test3

	2 virtual	C6: The student discovers any means of distinguishing between remote sensing vocabulary and is able to use laboratory tools within the specialty. C9: The student should be able to analyze data related to satellites and use calculators and programs. E3: The student must deal efficiently and effectively in the field of work and practice the characteristics and features of satellites.	Elements of aerial photographs and comparison between images	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Short test, final test
15	3 Laboratory	C9: The student should be able to analyze data related to satellites and use calculators and programs. C34: The student should monitor changes in natural phenomena, such as soil degradation, desertification, and water pollution, which lead to the death of beneficial organisms. D1: The student will use computer programs to analyze and display data and information in the field of remote sensing.	Radar imaging and interpretation of its results Tested on previously viewed devices	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Field project

Course Evaluation

No	Evaluation methods	Evaluation date	Grade	Relative weight
1	Report 1	fourth week	2.5	2.5
2	Report 2	The fifth week	2.5	2.5
3	Short test (1) Quiz	the sixth week	2	2
4	Short test (2) Quiz	The fourteenth week	2	2
5	Short test (3) Quiz	The fifteenth week	1	1
6	Semester test (1)	the sixth week	7.5	7.5
7	Semester test (2)	The eleventh week is difficult	7.5	7.5
8	Final theoretical test	Final semester exams	40	40
9	Practical field project	The fifteenth week	5	5
10	Field evaluation	The third and fifth week	2	2
11	Practical short test (1) Quiz	The first week	1	1
12	Short practical test (2) Quiz	fourth week	0.5	0.5
13	Short practical test (3) Quiz	The fourteenth week	1	1
14	Live drawings and homework	Weeks 6, 8, 9, 10, 11, 12 and 13	5.5	5.5
15	Final practical test	Final semester exams	20	20
	Total	100	100%	%100

Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Soil management and conservation
Main references (sources)	USDA
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

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