



Course Specifications

Course Title:	Groundwater Geophysics
Course Code:	GPH 417
Program:	B.Sc. in Geophysics
Department:	Geology and Geophysics
College:	College of Science
Institution:	King Saud University

Table of Contents

A. Course Identification	3
6. Mode of Instruction (mark all that apply)	3
B. Course Objectives and Learning Outcomes	3
1. Course Description	3
2. Course Main Objective.....	3
3. Course Learning Outcomes	4
C. Course Content	4
D. Teaching and Assessment	5
1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods	5
2. Assessment Tasks for Students	5
E. Student Academic Counseling and Support	5
F. Learning Resources and Facilities	6
1. Learning Resources	6
2. Facilities Required.....	6
G. Course Quality Evaluation	6
H. Specification Approval Data	7

A. Course Identification

1. Credit hours: 3 (2 + 0 + 2)
2. Course type
a. University <input type="checkbox"/> College <input type="checkbox"/> Department <input checked="" type="checkbox"/> Others <input type="checkbox"/>
b. Required <input type="checkbox"/> Elective <input checked="" type="checkbox"/>
3. Level/year at which this course is offered: NA
4. Pre-requisites for this course (if any): GPH 231
5. Co-requisites for this course (if any): NA

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	4	100%
2	Blended		
3	E-learning		
4	Distance learning		
5	Other		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	Lecture	30
2	Laboratory/Studio	30
3	Tutorial	
4	Others (specify)	
	Total	60

B. Course Objectives and Learning Outcomes

<p>1. Course Description Development of groundwater resources and exploration – Origin and occurrence of groundwater – Geological formation of groundwater – Aquifer parameters – the geophysical methods applicable in groundwater exploration (Electromagnetic, Electrical Resistivity, and Seismic Refraction methods).</p>
<p>2. Course Main Objective To provide students with most geophysical methods that are applicable to groundwater exploration and development.</p>

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	Knowledge and Understanding	
1.1	Recognize the basic principle of the applicable geophysical methods in groundwater exploration and development	1.1
1.2	Identify the field procedure; data acquisition, processing and interpretation of applicable geophysical methods in groundwater investigation	1.2
1.3		
1...		
2	Skills :	
2.1	Apply Electromagnetic (EM), Electrical Resistivity (ER) and Seismic Refraction methods in solving groundwater related problems.	2.1
2.2		
2.3		
2...		
3	Values:	
3.1	Work homogeneously and efficiently in group with good time management.	3.1
3.2	Good presentation skills.	3.2
3.3		
3...		

C. Course Content

No	List of Topics	Contact Hours
1	Development of groundwater resources and exploration	4
2	Origin and occurrence of groundwater	4
3	Geological formation of groundwater	4
4	Aquifer parameters	4
5	The geophysical methods applicable in groundwater exploration (Electromagnetic, Electrical Resistivity, and Seismic Refraction methods).	14
...		
Total		

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	Knowledge and Understanding		
1.1	Recognize the basic principle of the applicable geophysical methods in groundwater exploration and development	- Lectures - Discussions	- Quizzes - Home works - Mid-Term Exam - Final Exam
1.2	Identify the field procedure; data acquisition, processing and interpretation of applicable geophysical methods in groundwater investigation	- Lectures - Discussions	
1.3			
2.0	Skills		
2.1	Apply Electromagnetic (EM), Electrical Resistivity (ER) and Seismic Refraction methods in solving groundwater related problems.	- Practical labs - Discussions - Research	- Mid Term & Final Practical examinations - Report on Research work assignment
2.2			
...			
3.0	Values		
3.1	Work homogeneously and efficiently in group with good time management.	- Research work - Assignments	- Timely-submission of the research work and assignments
3.2	Good presentation skills.	- presentations	Design and deliver a presentation.
...			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Homework 1	3	1%
2	Homework 2	5	1%
3	First Mid-term exam	6	10%
4	Homework 3	8	1%
5	Homework 4	10	1%
6	Second Mid-term exam	12	10%
7	Presentation and Oral exam	14	6%
8	Practical exam	15	30%
9	Final exam	16	40%

*Assessment task (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

The Academic Faculty is available in his office for 4 hrs/week for consultation and academic advice to students. The Office Hours timings are pre-notified at the beginning of the Semester.

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	Groundwater Geophysics. A Tool for Hydrology. Reinhard Kirsch (Ed.). Springer (2011).
Essential References Materials	
Electronic Materials	
Other Learning Materials	

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	- Classroom having seating capacity for about 20 students, - Classroom must have a board, overhead projector, computer and internet connection.
Technology Resources (AV, data show, Smart Board, software, etc.)	- One PC connected to Data show in the lecture room
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of Teaching and assessment	Students	Indirect - Student course evaluation at the conclusion of the course
Extent of achievement of course learning outcomes	Faculty	Direct Calculating of the successes percentage for each student in each learning outcome of the course from the exams results
Quality of learning resources	Students	Indirect - Student course evaluation at the conclusion of the course

Evaluation Areas/Issues	Evaluators	Evaluation Methods

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)

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

Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	
Reference No.	
Date	