



## مواصفات مقرر: تقنيات الآبار الجوفية

### Course Specification of: Water Wells Technique

المعلومات العامة عن المقرر					
1.	اسم المقرر Course Title	تقنيات الآبار الجوفية Water Wells Technique			
2.	رمز المقرر ورقمه Course Code and Number	GEOS 463			
3.	الساعات المعتمدة للمقرر Credit Hours	الساعات المعتمدة			الإجمالي Total
		محاضرات Lecture	عملي Practical	سمنار/تمارين Seminar/Tutorial	
		2	1	-	3
4.	المستوى والفصل الدراسي Study Level and Semester	4 <sup>th</sup> level, 1 <sup>st</sup> semester			
5.	المتطلبات السابقة للمقرر (إن وجدت) Pre-requisites (if any)	GEOS 335			
6.	المتطلبات المصاحبة (إن وجدت) Co-requisites (if any)	GEOS 462			
7.	البرنامج الذي يدرس له المقرر Program(s) in which the course is offered	Bachelor of Geosciences -Hydrogeology Track			
8.	لغة تدريس المقرر Language of teaching the course	English/Arabic			
9.	نظام الدراسة Study System	Academic year of two semesters			
10.	مكان تدريس المقرر Location of teaching the course	Faculty of Petroleum and Natural Resources			
11.	اسم معد (و) مواصفات المقرر Prepared by	Dr. AlKhateeb Alkebsi د/ الخطيب الكبسي			
12.	تاريخ اعتماد مجلس الجامعة Date of Approval	2020			

### وصف المقرر

وصف المقرر بالإنجليزية	وصف المقرر بالعربية
	تعريف الطالب انواع الآبار الجوفية وطرق حفرها وتصميمها وكذلك تطويرها وتنظيفها واعادة تأهيلها

### مخرجات تعلم المقرر (CILOs)

After completing the course, the student will be able to:		بعد الانتهاء من دراسة المقرر سوف يكون الطالب قادرا على أن:
a1.	Describe the water cycle and its driving processes	- a1
a2.	Illustrate the different scientific facts, fundamental hydrogeologic terms, principles and techniques related to groundwater exploration and management	- a2

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Prof. Dr. Al Qaseem Mohammed Abas



<b>a3.</b>	Recognize in details the occurrences, origin and environmental problems associated with groundwater movements in aquifer systems		<b>a3.</b>
<b>b1.</b>	Assess the concepts, principles, procedures, theories and their interrelationships for interpreting hydrogeological data from different rock environs and deep sedimentary basins.		<b>-b1</b>
<b>b2.</b>	Recognize the significance of hydrogeology in solving different economic, environmental, constructional and water related problems.		<b>- b2</b>
<b>c1.</b>	Rate and solve problems related to groundwater aquifer evaluation and management		<b>- c1</b>
<b>c2.</b>	Handle laboratory equipment and field samples in appropriate manner, considering safety issues, scientific ethics and accuracy during reporting aquifer characteristics in different environs		<b>- c2</b>
<b>d1.</b>	Acquire the skills of working in groups according to responsibilities of each team member		<b>- d1</b>
<b>d2.</b>	Employ recent communication technology, internet and use of textbooks for collecting information and prepare short essays about groundwater flow regime and associated problems		<b>- d2</b>

مواصلة مخرجات تعلم المقرر مع مخرجات التعلم للبرنامج: Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)			
مخرجات التعلم المقصودة من المقرر (Course Intended Learning Outcomes)		مخرجات التعلم المقصودة من البرنامج (Program Intended Learning Outcomes) (تكتب جميع مخرجات البرنامج كما هي رمزا ونصا)	
<b>a1</b>	Describe the water cycle and its driving processes	<b>A1</b>	
<b>a2</b>	Illustrate the different scientific facts, fundamental hydrogeologic terms, principles and techniques related to groundwater exploration and management	<b>A2</b>	
<b>a3.</b>	Recognize in details the occurrences, origin and environmental problems associated with groundwater movements in aquifer systems	<b>A3</b>	
<b>b1</b>	Assess the concepts, principles, procedures, theories and their interrelationships for interpreting hydrogeological data from different rock environs and deep sedimentary basins.	<b>B1</b>	
<b>b2</b>	Recognize the significance of hydrogeology in solving different economic, environmental, constructional and water related problems.	<b>B2</b>	
<b>c1</b>	Rate and solve problems related to groundwater aquifer evaluation and management	<b>C2</b>	
<b>c2</b>	Handle laboratory equipment and field samples in appropriate manner, considering safety issues, scientific ethics and accuracy during reporting aquifer	<b>C3</b>	



	characteristics in different environs		
d1	Acquire the skills of working in groups according to responsibilities of each team member	D1	
d2	Employ recent communication technology, internet and use of textbooks for collecting information and prepare short essays about groundwater flow regime and associated problems	D3	

مواصلة مخرجات التعلم باستراتيجيات التعليم والتعلم والتقييم Alignment of CILOs to Teaching and Assessment Strategies			
أولاً: مواصلة مخرجات تعلم المقرر (المعارف والفهم) باستراتيجية التعليم والتعلم والتقييم: First: Alignment of Knowledge and Understanding CILOs			
	مخرجات المقرر / المعرفة والفهم Knowledge and Understanding CILOs	استراتيجية التعليم والتعلم Teaching Strategies	استراتيجية التقييم Assessment Strategies
a1 -	Describe the water cycle and its driving processes	Interactive Lectures Discussion Case study	Examinations, Assignments, Oral presentations
a2 -	Illustrate the different scientific facts, fundamental hydrogeologic terms, principles and techniques related to groundwater exploration and management		
a3 -	Recognize in details the occurrences, origin and environmental problems associated with groundwater movements in aquifer systems		
ثانياً: مواصلة مخرجات تعلم المقرر (المهارات الذهنية) باستراتيجية التدريس والتقييم: Second: Alignment of Intellectual Skills CILOs			
	مخرجات المقرر / المهارات الذهنية Intellectual Skills CILOs	استراتيجية التعليم والتعلم Teaching Strategies	استراتيجية التقييم Assessment Strategies
b1 -	Assess the concepts, principles, procedures, theories and their interrelationships for interpreting hydrogeological data from different rock environs and deep sedimentary basins.	Discussion Demonstration Brain storm Problem solving	Essay test, Assignments, Oral presentations.
b2 -	Recognize the significance of hydrogeology in solving different economic, environmental, constructional and water related problems.		
ثالثاً: مواصلة مخرجات تعلم المقرر (المهارات المهنية والعملية) باستراتيجية التدريس والتقييم: Third: Alignment of Professional and Practical Skills CILOs			
	مخرجات المقرر / المهارات المهنية والعملية	استراتيجية التعليم	استراتيجية التقييم



Professional and Practical Skills CILOs		والتعلم Teaching Strategies	Assessment Strategies
c1-	Rate and solve problems related to groundwater aquifer evaluation and management	Tutorials & practical classes, case study, Computer based teaching	Achievement tests Chart Drawing practical exams
c2-	Handle laboratory equipment and field samples in appropriate manner, considering safety issues, scientific ethics and accuracy during reporting aquifer characteristics in different environs		

رابعاً: مواءمة مخرجات تعلم المقرر (المهارات العامة) باستراتيجية التدريس والتقويم:

Fourth: Alignment of Transferable (General) Skills CILOs

مخرجات المقرر Transferable (General) Skills CILOs		استراتيجية التعليم والتعلم Teaching Strategies	استراتيجية التقويم Assessment Strategies
d1-	Acquire the skills of working in groups according to responsibilities of each team member	Small group working Case Study Method	Achievement tests Team working
d2-	Employ recent communication technology, internet and use of textbooks for collecting information and prepare short essays about groundwater flow regime and associated problems		

محتوى المقرر Course Content

Theoretical Aspect الموضوعات الجانب النظري

الرقم Order	الموضوعات الرئيسية/الوحدات Topic List / Units	الموضوعات الفرعية Sub Topics List	عدد الأسابيع Number of Weeks	الساعات الفعالية Contact Hours	رموز مخرجات التعلم للمقرر (CILOs)
1	Groundwater Well Types	Shallow and deep wells	2	4	a1 a2
2	Well drilling Types	Hand and jetting tools	3	6	a3 b1 c1
3	Groundwater Well Design	High and low production well	3	6	a3 b1 c1
4	Well Cleaning	Pumping and surging	3	6	a2 a3 b1 b2 c2 d1
5	Groundwater development and Rehabilitation	Pumping and surging and other methods	3	6	a2 a3 b1 b2 c2 d1
عدد الأسابيع والساعات الفعلية Number of Weeks /and Contact Hours Per Semester			14	28	

Practical Aspect (if any) الموضوعات العملية (إن وجدت)

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الرقم Order	التجارب العملية/ التمارين / تدريبات Practical / Exercises/ Tutorials topics	عدد الأسابيع Number of Weeks	الساعات الفعلية Contact Hours	رموز مخرجات التعلم Course ILOs
1	Exercises and problems	3	6	a1
2	Sampling	3	6	b1 c1
3	Field visiting	1	2	b2 c1 c2 d1 d2
4	Videos	3	6	b2 c2 d1 d2
5	Measurements	3	6	b2 c2 d1 d2
اجمالي الأسابيع والساعات الفعلية Number of Weeks /and Contact Hours Per Semester		13	26	

### استراتيجيات التعليم والتعلم Teaching Strategies

- Interactive Lectures
- Discussion
- Problem solving
- Case study,
- Computer based teaching

### الأنشطة والتكليفات Tasks and Assignments

م No	التكليف/ الواجب Assignments/ Tasks	نوع التكليف (فردى/ تعاوني)	الدرجة المستحقة Mark	أسبوع التنفيذ Week Due	مخرجات التعلم CILOs (symbols)
1	Homework	Individual	10	1-14	b1,b2.c1, c2,
2	Term project	Cooperative	10	1-14	b1,b2.c1, c2,,d1
إجمالي الدرجة Total Score			20		

### تقييم التعلم Learning Assessment

الرقم No.	أنشطة التقييم Assessment Tasks	أسبوع التقييم Week due	الدرجة Mark	نسبة الدرجة إلى الدرجة النهائية Proportion of Final Assessment	مخرجات التعلم CILOs (symbols)
1	الأنشطة والتكليفات Tasks and Assignments	W1-14	20	10%	b1, b2, c1,c2
2	اختبار نصف الفصل Midterm Exam	W8	30	15%	a1,a2,a3,c1,c2
3	اختبار نهاية الفصل (عملي) Final Exam (practical)	W 15	30	25%	a1,a2 a3,c1,c2,d1



4	اختبار نهاية الفصل (نظري) Final Exam (theoretical)	W16	70	50%	a1,a2, a3 b1,b2,
<b>Total الإجمالي</b>			<b>150</b>	<b>100.00%</b>	

Learning Resources مصادر التعلم	
<b>Required Textbook(s) المراجع الرئيسية (لا تزيد عن مرجعين)</b>	
1. Driscoll, 1998, Groundwater and Wells, Johnson's FSI. 2. Todd D.K., 2005, Groundwater Hydrology, Wiley, USA.	
<b>References</b>	
1. Harlan, Kolm, 1989, Water-well Design and Construction, Elsevier. 2. Fetter, 1990, Applied Hydrogeology, CBS, India..	
<b>Electronic Materials and Web Sites etc. المصادر الإلكترونية ومواقع الإنترنت</b>	
Journal of hydrology, Elsevier	

Course Policies:	
<b>1</b>	<b>Class Attendance:</b> - Students are expected to attend classes regularly and promptly. - The attendance should not be less than 80%. - If the student has been absent, he is responsible for finding out any missed material by consulting other students or going to the professor's office hours.
<b>2</b>	<b>Tardy:</b> - Attendance and arriving on time for the class are necessary. If the student is late, he will be prevented from class.
<b>3</b>	<b>Exam Attendance/Punctuality:</b> - According to the rules the student gets absent in the exam of the course.
<b>4</b>	<b>Assignments &amp; Projects:</b> - Papers survey or projects should be submitted by the time detriment by the professor.
<b>5</b>	<b>Cheating:</b> - According to the rules, cheating is a serious offense and will always result in an imposition of a penalty. The penalties that can be started from the range of canceling the result of the course to canceling the student's admission.
<b>6</b>	<b>Plagiarism:</b> - Plagiarism is a serious offense and will always result in an imposition of a penalty. The penalties that can be started by making a zero mark for the work.
<b>7</b>	<b>Other policies:</b> - The student should by a commitment by the rules inside class and university. Therefore, he is expected to show respect for his classmate, instructors & others.



قسم/ برنامج: العلوم الجيولوجية (مسار جيولوجيا المياه Hydrogeology) Geosciences  
العام الجامعي: 2020-2021م

خطة مقرر: جيولوجيا المياه  
Course Plan (Syllabus): Hydrogeology

معلومات عن أستاذ المقرر Information about Faculty Member Responsible for the Course						
الاسم Name	الدكتور: الخطيب يحيى الكبسي		الساعات المكتبية (أسبوعياً) Office Hours			
المكان ورقم الهاتف Location & Telephone No.	جامعة صنعاء 770828128		السبت SAT	الأحد SUN	الاثنين MON	الثلاثاء TUE
البريد الإلكتروني E-mail	aalkebsi@yahoo.com					الأربعاء WED
						الخميس THU

معلومات عامة عن المقرر General information about the course						
1.	اسم المقرر Course Title	تقنيات الآبار الجوفية Water Wells Technique				
2.	رمز المقرر ورقمه Course Code and Number	GEOS 463				
3.	الساعات المعتمدة للمقرر Credit Hours	الساعات المعتمدة Credit Hours				الإجمالي Total
		محاضرات Lecture	عملي Practical	سمنار/تمارين Seminar/Tutorial	تدريب Training	
		2	1	-	-	3
4.	المستوى والفصل الدراسي Study Level and Semester	4 <sup>th</sup> level, 1 <sup>st</sup> semester				
5.	المتطلبات السابقة للمقرر Pre-requisites	GEOS 335				
6.	المتطلبات المصاحبة (إن وجدت) Co-requisite	GEOS 462				
7.	البرنامج الذي يدرس له المقرر Program (s) in which the course is offered	Bachelor of Geosciences -Hydrogeology Track				
8.	لغة تدريس المقرر Language of teaching the course	English/Arabic				
9.	مكان تدريس المقرر Location of teaching the course	Faculty of Petroleum and Natural Resources				

وصف المقرر Course Description	
	تعريف الطالب انواع الآبار الجوفية وطرق حفرها وتصميمها وكذلك تطويرها وتنظيفها واعادة تاهيلها

مخرجات تعلم المقرر Course Intended Learning Outcomes (CILOs)	
After completing the course, the student will be able to:	بعد الانتهاء من دراسة المقرر سوف يكون الطالب قادراً على أن:



Describe the water cycle and its driving processes	- a1
Illustrate the different scientific facts, fundamental hydrogeologic terms, principles and techniques related to groundwater exploration and management	- a2
Recognize in details the occurrences, origin and environmental problems associated with groundwater movements in aquifer systems	-a3
Assess the concepts, principles, procedures, theories and their interrelationships for interpreting hydrogeological data from different rock environs and deep sedimentary basins.	-b1
Recognize the significance of hydrogeology in solving different economic, environmental, constructional and water related problems.	- b2
Rate and solve problems related to groundwater aquifer evaluation and management	- c1
Handle laboratory equipment and field samples in appropriate manner, considering safety issues, scientific ethics and accuracy during reporting aquifer characteristics in different environs	- c2
Acquire the skills of working in groups according to responsibilities of each team member	- d1
Employ recent communication technology, internet and use of textbooks for collecting information and prepare short essays about groundwater flow regime and associated problems	- d2

Course Content محتوى المقرر				
Theoretical Aspect خطة تنفيذ الموضوعات النظرية				
الرقم Order	الوحدات (الموضوعات الرئيسية) Units	الموضوعات التفصيلية Sub Topics	الأسبوع Week Due	الساعات الفعلية Con. H
1	Groundwater Well Types	Shallow and deep wells	Week 1-2	4
2	Well drilling Types	Hand and jetting tolls	Week 3-5	6
3	Groundwater Well Design	High and low production well	Week 6-8	6
4	Mid term exam		Week 9	2
5	Well Cleaning	Pumping and surging	Week 10-12	6
6	Groundwater development and Rehabilitation	Pumping and surging and other methods	Week 13-15	6
12	Final exam		Week 16	2
عدد الأسابيع والساعات الفعلية			<b>16</b>	<b>32</b>

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Number of Weeks /and Contact Hours Per Semester

خطة تنفيذ موضوعات الجانب العملي Practical / Training/ Tutorials/ Exercises Aspects			
الرقم Order	موضوعات العملي/ المهام / التمارين Practical/ Tutorials/ Exercises Aspects	الأسبوع Week Due	الساعات الفعلية Cont. H
1	Exercises and problems	1-3	6
2	Sampling	4-6	6
3	Field visiting	7	2
4	Mid lab exam	8	2
5	Videos	9-11	6
6	Measurements	12-14	6
11	Final lab exam	15	2
اجمالي الأسابيع والساعات الفعلية Number of Weeks /and Contact Hours Per Semester		15	30

استراتيجيات التعليم والتعلم Teaching Strategies

- Interactive Lectures
- Discussion
- Problem solving
- Case study,
- Computer based teaching
- Student-led Seminars

الأنشطة والتكليفات Tasks and Assignments

م No	التكليف/ الواجب Assignments	نوع التكليف (فردى/ تعاونى)	الدرجة المستحقة Mark	أسبوع التنفيذ Week Due
1	Homework	Individual	10	1-14
2	Term project	Cooperative	10	1-14
Total Score إجمالي الدرجة			20/150	

تقويم التعلم Learning Assessment

م No	أساليب التقويم Assessment Method	موعد (أسبوع) التقويم Week Due	الدرجة Mark	الوزن النسبي % Proportion of Final Assessment
1	الأنشطة والتكليفات Tasks and Assignments	W1-14	20	10%



2	اختبار نصف الفصل Midterm Exam	W8	30	15%
3	اختبار نهاية الفصل (عملي) Final Exam (practical)	W 15	30	25%
4	اختبار نهاية الفصل (نظري) Final Exam (theoretical)	W16	70	50%
المجموع Total			150	100.00%

### Learning Resources مصادر التعلم

#### المراجع الرئيسية (لا تزيد عن مرجعين) Required Textbook(s)

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#### References

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#### المصادر الإلكترونية ومواقع الإنترنت Electronic Materials and Web Sites etc.

Journal of hydrology, Elsevier

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