

وزارة التعليم العالي والبحث العلمي
جهاز الإشراف والتقويم العلمي
دائرة ضمان الجودة والاعتماد الأكاديمي
قسم الاعتماد



دليل وصف البرنامج الأكاديمي والمقرر الدراسي

2026/2025

نموذج وصف البرنامج الأكاديمي

اسم الجامعة: جامعة بغداد

الكلية/ المعهد: كلية العلوم

القسم العلمي: قسم علم الأرض

اسم البرنامج الأكاديمي او المهني: بكالوريوس علم الأرض

اسم الشهادة النهائية: بكالوريوس في علم الأرض

النظام الدراسي: نظام بولونيا (المرحلة الاولى والثانية والثالثة) + نظام فصلي (المرحلة الرابعة)

تاريخ اعداد الوصف: 01-10-2025

تاريخ ملء الملف: 01-10-2025



التوقيع:

اسم المعاون العلمي: أ.د. نمير إبراهيم عباس
التاريخ:



التوقيع:

اسم رئيس القسم: أ.د. سلام اسماعيل مرهون
التاريخ: 2025-10-01

دقق الملف من قبل: شعبة ضمان الجودة والأداء الجامعي

التوقيع:

اسم مدير شعبة ضمان الجودة والأداء الجامعي: أ.د. اسراء علي زيدان

التاريخ:



مصادقة السيد العميد:

أ.د. راند فالح حسن

1. رؤية البرنامج
الريادة والتميز في مجالات علوم الأرض، وتزويد سوق العمل بالكفاءات العلمية التي تتماشى مع التطورات التكنولوجية والمعرفية الحديثة.

2. رسالة البرنامج
تتمثل مهمة البرنامج الأكاديمي لقسم علم الأرض في إعداد خريجين محترفين قادرين على إجراء البحوث العلمية في مختلف مجالات علوم الأرض بما يتماشى مع متطلبات سوق العمل. ويهدف البرنامج إلى تخريج متخصصين ذوي كفاءة عالية ومهارات متميزة، يتميزون بالمهنية والقيادة والعمل الجماعي، وذلك بتزويدهم بالمعرفة والمهارات اللازمة لخدمة المجتمع. كما يسعى البرنامج إلى إعداد جيولوجيين ذوي مستوى تعليمي عالٍ يدمج المعرفة النظرية والتطبيقية في إطار التنمية المستدامة وبما يتماشى مع الرؤية الوطنية.

3. أهداف البرنامج
يمكن تلخيص أهداف البرنامج الأكاديمي لقسم علم الأرض في النقاط التالية:
1. إعداد خريجين قادرين على مواكبة التطورات المحلية والعالمية بما يتماشى مع متطلبات سوق العمل.
2. تبني أساليب تدريس حديثة ومعاصرة لتحقيق الأهداف التعليمية المنشودة، مثل العصف الذهني، والتدريس المتمايز، واستراتيجيات التغذية الراجعة، بما يعزز التفكير الإبداعي لدى الطلاب.
3. تشجيع تنمية مهارات الطلاب ومواهبهم اللامنهجية وصقلها، بالإضافة إلى تعزيز الأنشطة التطوعية والعمل الجماعي.
4. تطوير وتحديث مناهج البكالوريوس والدراسات العليا في مختلف تخصصات علوم الأرض لتلبية معايير التنافسية العالمية.
5. دعم البحث العلمي في مختلف المجالات الجيولوجية ونشر نتائج البحوث في مجلات دولية مرموقة، بالإضافة إلى تسويق البحوث التطبيقية.
6. الارتقاء بقسم علم الأرض من خلال الحصول على اعتماد البرامج الأكاديمية المتخصصة.
7. تنظيم ندوات ومؤتمرات علمية وأنشطة أكاديمية أخرى بانتظام لتعزيز ثقة طلاب البكالوريوس والدراسات العليا في تخصصاتهم، ورفع مستوى الوعي بأهميتها من خلال اهتمام المؤسسات الأكاديمية المتخصصة.

8. توفير فرص التدريب الميداني من خلال رحلات ميدانية رفقة أعضاء هيئة التدريس، وتعريف الطلاب ببيئات العمل المستقبلية عبر التدريب الصيفي في المؤسسات الحكومية، مما يعزز مفهوم الشراكة والتعاون مع المؤسسات الحكومية.

9. تشجيع التعاون الأكاديمي بين تخصصات علوم الأرض ومجالات أخرى كالفيزياء والكيمياء والأحياء والطب وعلوم البيئة وعلم الفلك والهندسة، بما يسهم في تطوير البحوث متعددة التخصصات التي تخدم المجتمع.

4. الاعتماد البرامجي

يعمل قسم علم الأرض حاليًا على استكمال متطلبات اعتماد البرنامج وفقًا للمعايير التي وضعتها وزارة التعليم العالي والبحث العلمي في العراق، وبالتنسيق مع وحدة ضمان الجودة وأداء الجامعة في كلية العلوم بجامعة بغداد. ويسعى القسم جاهدًا لتطوير خطته الأكاديمية، وتحديث مناهجه الدراسية، وتعزيز قدراته التعليمية والبحثية بما يتماشى مع معايير الاعتماد الوطنية والدولية، بهدف تحقيق التميز الأكاديمي وضمان جودة التعليم بما يلبي متطلبات سوق العمل ومتطلبات التنمية المستدامة.

5. المؤثرات الخارجية الأخرى

التدريب الصيفي، الزيارات الميدانية، الدورات التدريبية، البحث العلمي، المختبرات، المكتبة، الرحلات الجيولوجية الميدانية

6. هيكلية البرنامج

هيكل البرنامج	عدد المقررات	وحدة دراسية	النسبة المئوية	ملاحظات *
متطلبات المؤسسة	9	17	10%	
متطلبات الكلية	5	20	12%	
متطلبات القسم	37	132	78%	
التدريب الصيفي	2	-	-	
اخرى	-	-	-	

* ممكن ان تتضمن الملاحظات فيما اذا كان المقرر أساسي او اختياري.

7. وصف البرنامج			
السنة / المستوى	رمز المقرر أو المساق	اسم المقرر أو المساق	الساعات المعتمدة
2025-2026 المرحلة الاولى/ الفصل الدراسي الاول	GEO11001	الجيولوجيا الطبيعية	3
	GEO11002	علم البلورات	3
	GEO11003	الكيمياء	3
	UOB102	اللغة الإنجليزية 1	\
	UOB103	مهارات الحاسوب الأساسية 1	2
	UOB104	الديمقراطية وحقوق الإنسان	\
2025-2026 المرحلة الاولى/ الفصل الدراسي الثاني	GEO12004	الجيولوجيا التاريخية	3
	GEO12005	علم المعادن	3
	GEO12006	الفيزياء العامة	3
	GEO12007	الرياضيات	\
	UOB101	اللغة العربية ١	\
	GEO23008	المتحجرات اللافقارية ١	3
2025-2026 المرحلة الثانية/ الفصل الدراسي الاول	GEO23009	بصرية المعادن	3
	GEO23010	الجيولوجيا التركيبية ١	3
	GEO23011	علم اشكال الأرض	3
	UOB202	اللغة الإنجليزية ٢	\
	UOB203	الحاسوب ٢	2
	UOB105	جرائم نظام البعث في العراق	\
2025-2026 المرحلة الثانية/ الفصل الدراسي الثاني	GEO24012	المتحجرات اللافقارية ٢	3
	GEO24013	علم الصخور	3
	GEO24014	الجيولوجيا التركيبية ٢	3
	GEO24015	الاستشعار عن بعد	3
	GEO24016	علم الرسوبيات	3
	GEO24017	الإحصاء	\
2025-2026 المرحلة الثالثة/ الفصل الدراسي الاول	UOB201	اللغة العربية ٢	\
	GEO35018	المتحجرات الدقيقة	3
	GEO35019	الصخور النارية	3
	GEO35020	الجيوتكتونكس	3
	GEO35021	الجيوفيزياء ١ (الطرق الجذبية والمغناطيسية)	3
	GEO35022	علم الطبقات	3
2025-2026 المرحلة الثالثة/ الفصل الدراسي الثاني	GEO35023	الصخور الرسوبية	3
	GEO36124	البيئة القديمة	3
	GEO36125	الصخور المتحولة	3
	GEO36126	الجيولوجيا الحقلية	3
	GEO36027	الجيوفيزياء ٢ (الطرق الزلزالية والكهربائية)	3
	GEO36028	جيولوجيا العراق	3
2025-2026	UOB309	منهجية البحث	-
	GEO4832	الجيولوجيا الهندسية	3
	GEO4833	جيولوجيا تحت السطح	3
	GEO4834	الجيوكيمياء	3

3	2	الجيولوجيا البيئية	GEO4835	المرحلة الرابعة/
2	/	مشروع بحثي ١	GEO4836	الفصل الدراسي الاول
3	2	الموارد المائية	GEO4938	2025-2026 المرحلة الرابعة/ الفصل الدراسي الثاني
3	2	جيولوجيا النفط	GEO4939	
3	2	جيولوجيا الخامات	GEO4940	
3	2	التلوث البيئي	GEO4941	
4	2	كورس العمل الحقل الجيولوجي	GEO4943	
/	2	استكشاف نفطي	GEO4942	
/	2	معالجة اشارات	-	
/	2	طرق اشعاعية	-	

8. مخرجات التعلم المتوقعة للبرنامج
المعرفة
1. فهم شامل للنظريات الجيولوجية الأساسية 2. تحليل الخصائص الفيزيائية والكيميائية للصخور والمعادن 3. تطبيق المعرفة الجيولوجية لحل المشكلات البيئية والصناعية 4. استخدام التقنيات الحديثة في البحوث الجيولوجية
المهارات
1. مهارات العمل الميداني والمسح الجيولوجي 2. مهارات التحليل المختبري والفني 3. مهارات حل المشكلات واتخاذ القرارات 4. مهارات استخدام التقنيات الرقمية وبرامج الجيولوجيا
القيم
1. تعزيز الوعي البيئي والمسؤولية تجاه الموارد الطبيعية 2. الالتزام بالأخلاقيات العلمية والمهنية 3. تعزيز العمل الجماعي والقيادة المسؤولة 4. الانتماء الوطني والمساهمة في التنمية المستدامة

9. استراتيجيات التعليم والتعلم

تستخدم برامج الجيولوجيا في الجامعات عادةً مجموعة متنوعة من الاستراتيجيات وطرق التدريس لضمان فعالية العملية التعليمية وتحقيق أهداف التعلم. ومن هذه الاستراتيجيات والأساليب:

1. المحاضرات التفاعلية: تتيح المحاضرات التفاعلية للطلاب المشاركة الفعالة في العملية التعليمية من خلال المناقشات والتبادلات مع المعلم وفيما بينهم. يتم تشجيع الطلاب على طرح الأسئلة والمشاركة في حل المشكلات المعقدة.
2. الدروس العملية والعمل المختبري: يتم تنظيم جلسات عملية في المختبرات والعمل الميداني لتعزيز الفهم العملي للمفاهيم الجيولوجية، وتمكين الطلاب من التفاعل مع العينات الجيولوجية والبيانات الجيوفيزيائية.
3. دراسات الحالة والمشاريع البحثية: توفر دراسات الحالة والمشاريع البحثية للطلاب فرصة لتطبيق المفاهيم النظرية على سيناريوهات العالم الحقيقي، وتعزيز فهمهم للتحديات الجيولوجية وتطوير مهاراتهم البحثية والتحليلية.
4. الاستخدام الفعال للتكنولوجيا في التعليم: ويشمل ذلك استخدام الوسائط المتعددة مثل مقاطع الفيديو التعليمية والمحاكاة الحاسوبية وبرامج الجغرافيا لتقديم تجارب تعليمية تفاعلية وجذابة.
5. المناقشات وورش العمل: يتم تنظيم جلسات المناقشة وورش العمل للسماح للطلاب بتبادل الأفكار والآراء، وحل المشكلات الجيولوجية المعقدة، مما يساعدهم على بناء مهارات التفكير النقدي وحل المشكلات.
6. التقييم التشخيصي والتفاعلي: يتم استخدام أساليب التقييم التشخيصي المستمر لقياس تقدم الطلاب وفهمهم مع تقديم التغذية الراجعة البناءة لمساعدتهم على تحسين أدائهم وتعميق فهمهم.
7. التعلم التعاوني: يُشجّع هذا النوع من التعلم الطلاب على التعاون ضمن مجموعات صغيرة لحل المشكلات وإنجاز المشاريع، مما يُعزّز التفاعل الاجتماعي ويُنمّي فهمًا مشتركًا لمحتوى المقرر.

10. طرائق التقييم

فيما يلي بعض أساليب التقييم الشائعة وكيفية تطبيقها في جميع مراحل برنامج الجيولوجيا:

1. التقييم التشخيصي:
 - يُستخدم هذا النوع من التقييم في المرحلة التمهيدية لتحديد مستوى معارف ومهارات الطلاب قبل بدء الدورة.
 - يشمل التقييم التشخيصي اختبارات قصيرة، وأسئلة مبنية على استبيانات، ومقابلات شخصية.
2. التقييم التكويني:
 - يُجرى التقييم التكويني على فترات محددة خلال الفصل الدراسي، بهدف تقييم تقدم الطلاب في مختلف المواد.
 - يتضمن هذا النوع من التقييم اختبارات، وواجبات، ومشاريع قصيرة.

3. التقييم المستمر:

- يُجرى التقييم المستمر طوال الفصل الدراسي لتقييم تطور فهم الطلاب ومهاراتهم بشكل دائم.
- يشمل هذا النوع من التقييم مشاركة الطلاب في المناقشات الصفية، والأنشطة الجماعية، وتقديم التقارير، ومشاريع الفصل الدراسي.

4. التقييم الختامي:

- يُجرى التقييم الختامي في نهاية الفصل الدراسي أو في نهاية وحدة دراسية، وهو مصمم لتقييم الفهم الشامل للمواد.
- يشمل هذا النوع من التقييم الامتحانات النهائية، والمشاريع الكبيرة، والبحوث الفردية.

5. التقييم الذاتي:

- يشجع التقييم الذاتي الطلاب على تقييم أدائهم وفهمهم للمادة، ويمكن أن يكون جزءاً من عملية التقييم المستمر.
- يمكن للطلاب استخدام مفاهيم مثل الملاحظة الذاتية والتقارير الشخصية لتقييم تقدمهم وتحديد نقاط قوتهم وضعفهم.

6. التقييم القائم على المشاركة:

- يشمل التقييم القائم على المشاركة تقييم أداء الطلاب خلال المناقشات الصفية، وورش العمل، والمشاريع الجماعية.
- يركز هذا النوع من التقييم على مستوى المشاركة والتفاعل والتعاون بين الطلاب.

11. الهيئة التدريسية

أعضاء هيئة التدريس

الرتبة العلمية		التخصص		المتطلبات/المهارات الخاصة (ان وجدت)		اعداد الهيئة التدريسية	
الرتبة العلمية		عام	دقيق	المتطلبات/المهارات الخاصة (ان وجدت)		ملاك	محاضر
الاستاذ الدكتور سلام اسماعيل مرهون		علم الارض	علم الطبقات والمتحجرات			√	
الاستاذ الدكتور ايباد علي حسين علي		علم الارض	علم الطبقات والمتحجرات			√	
الاستاذ الدكتور حامد حسن عبد الله		علم الارض	الجيولوجيا الهندسية			√	
الاستاذ الدكتور صالح محمد عوض		علم الارض	الجيوكيمياء			√	
الاستاذ الدكتور علي مكي حسين الرحيم		علم الارض	الجيوفيزياء			√	
الاستاذ الدكتور قصي ياسين سلمان		علم الارض	الموارد المائية			√	
الاستاذ الدكتور كمال كريم علي		علم الارض	الجيوفيزياء			√	
الاستاذ الدكتور منال شاكر علي		علم الارض	الجيولوجيا التركيبية			√	
الاستاذ لؤي سمير شاكر		علم الارض	علم الطبقات والمتحجرات			√	
الاستاذ المساعد الدكتور افراح حسن صالح		علم الارض	علم الطبقات والمتحجرات			√	
الاستاذ المساعد الدكتور براق عدنان حسين		علم الارض	جيولوجيا النفط			√	
الاستاذ المساعد الدكتور انعام جمعة عبدالله		علم الارض	الجيوكيمياء			√	

الاستاذ المساعد الدكتور فراس مظفر عبد الحسين	علم الارض	الجيوكيمياء	√	
الاستاذ المساعد الدكتور مرتضى جبار عيسى	علم الارض	الجيوكيمياء	√	
الاستاذ المساعد الدكتور نجاح عبد الحسن عبد	علم الارض	الجيوفيزياء	√	
الاستاذ المساعد الدكتور مصطفى علي حسن	علم الارض	الهيدروجيوكيمياء	√	
الاستاذ المساعد الدكتور أثير عيدان خليل	علم الارض	علم اشكال الأرض، والجيولوجيا التركيبية، والاستشعار عن بعد	√	
الاستاذ المساعد الدكتور ثامر الطيف	علم الارض	الجيولوجيا الهندسية	√	
الاستاذ المساعد الدكتور أسامة سعد صاحب	علم الارض	الجيوفيزياء	√	
الاستاذ المساعد الدكتور مؤيد جاسم رشيد	علم الارض	علم اشكال الأرض	√	
الاستاذ المساعد الدكتور أنوار كاظم موسى	علم الارض	علم الطبقات والمتحجرات	√	
الاستاذ المساعد الدكتور ثامر عبدالله مهدي	علم الارض	علم الطبقات وتطبيقات نفطية	√	
الاستاذ المساعد الدكتور رنا عباس علي	علم الارض	الجيوكيمياء	√	
الاستاذ المساعد الدكتور لميس نزار عبد الكريم	علم الارض	الجيوفيزياء	√	
الاستاذ المساعد الدكتور رشا فوزي فيصل	علم الارض	جيولوجيا النفط	√	
المدرس الدكتور احمد كاظم عبيد	علم الارض	الجيوتكتونكس	√	
المدرس الدكتور إيمان أحمد محمد	علم الارض	الموارد المائية	√	
المدرس الدكتور جنان منصور كورنيل	علم الارض	الجيولوجيا التركيبية	√	
المدرس الدكتور حارث إسماعيل مصطفى	علم الارض	علم الصخور والمعادن	√	
المدرس الدكتور زينب ضماد حسن	علم الارض	علم شكل الأرض والاستشعار عن بعد	√	
المدرس الدكتور حسن كطوف جاسم	علم الارض	علم الصخور والمعادن	√	
المدرس الدكتور صفاء أديب صالح	علم الارض	علم الصخور والمعادن	√	
المدرس الدكتور محمد حسن ناصر	علم الارض	الجيولوجيا الهندسية	√	
المدرس الدكتور هبة سعدون محسن	علم الارض	جيولوجيا النفط	√	
المدرس الدكتور هند فاضل عبدالله	علم الارض	الموارد المائية	√	
المدرس الدكتور لمى جاسم محمد	علم الارض	مكامن النفط	√	
المدرس الدكتور لقاء فالج عودة	علم الارض	اللغة العربية	√	
المدرس شذى فتحي حسن	علم الارض	الجيولوجيا الهندسية	√	
المدرس الدكتور حادي سالم عبيد	علم الارض	موارد مائية / المياه الجوفية	√	
المدرس المساعد ليث صباح عبد علي	علم الارض	الجيوفيزياء	√	
المدرس المساعد آية علي حميد	علم الارض	الجيولوجيا التركيبية	√	
المدرس المساعد نعم عمر فرحان	علم الارض	الجيوكيمياء	√	
المدرس المساعد أنسام حسن رشيد	علم الارض	الجيوفيزياء	√	
المدرس المساعد سالي حسين احمد	علم الارض	الجيولوجيا التركيبية، الاستشعار عن بعد، والجيومورفولوجيا	√	
المدرس المساعد زهراء إياد هادي	علم الارض	الجيوكيمياء	√	

12. التطوير المهني
توجيه أعضاء هيئة التدريس الجدد
تتضمن عملية توجيه أعضاء هيئة التدريس الجدد والزائرين، سواء كانوا بدوام كامل أو جزئي، على مستوى المؤسسة والأقسام، الخطوات التالية بإيجاز:

1. تقديم تعريف بالمؤسسة والقسم: يُقدّم تعريف شامل بالمؤسسة، وبيئتها التعليمية، وأهدافها، وقيمها المؤسسية، بالإضافة إلى شرح لدور القسم في تحقيق هذه الأهداف.
2. التوجيه بشأن السياسات والإجراءات: تُشرح السياسات والإجراءات الإدارية والأكاديمية المتعلقة بالتدريس والبحث وخدمة المجتمع، بما في ذلك إجراءات التقييم والترقية، ومعالجة شؤون الطلاب، وغير ذلك.
3. تقديم الدعم الأكاديمي والتدريسي: يُقدّم الدعم والتوجيه بشأن تطوير المناهج الدراسية، وتخطيط الدروس، واستخدام التكنولوجيا التعليمية، وتطبيق أساليب التدريس الحديثة.
4. التعريف بالموارد المتاحة: يُسلّط الضوء على الموارد المتاحة لأعضاء هيئة التدريس، مثل المكتبات والمختبرات ومرافق البحث وفرص التمويل والتدريب المستمر.
5. التوجيه الاجتماعي والثقافي: يشمل ذلك التوجيه بشأن الحياة الجامعية والأنشطة الثقافية والاجتماعية داخل المؤسسة والمجتمع المحلي، بما في ذلك الفعاليات الثقافية والرياضية والاجتماعية.
6. توفير فرص التواصل والتفاعل الاجتماعي: تشجيع بناء الشبكات والتعاون بين أعضاء هيئة التدريس الجدد والحاليين والطلاب والموظفين الإداريين لتعزيز التواصل وتبادل الخبرات.

التطوير المهني لأعضاء هيئة التدريس

- تتضمن خطة التطوير الأكاديمي والمهني لأعضاء هيئة التدريس عدة عناصر أساسية:
1. تقديم ورش عمل ودورات تدريبية: تُنظّم ورش عمل ودورات تدريبية لتطوير مهارات أعضاء هيئة التدريس في مجالات التدريس والتعلم الحديثة، مثل تكنولوجيا التعليم، وأساليب التقييم، والتدريس التفاعلي.
 2. الإرشاد الفردي والتقييم النقدي: تُقدّم جلسات إرشاد فردية وتقييمات نقدية لأداء أعضاء هيئة التدريس، مع التركيز على تعزيز مهاراتهم، ومعالجة نقاط ضعفهم، وتحديد فرص التحسين.
 3. المشاركة في المؤتمرات والندوات: يُشجّع أعضاء هيئة التدريس على المشاركة في المؤتمرات وورش العمل والندوات المحلية والدولية لتبادل الخبرات والأفكار، والاستفادة من التطورات الجديدة في المجال.
 4. البحث والنشر الأكاديمي: يُشجّع أعضاء هيئة التدريس على مواصلة البحث العلمي ونشر نتائجه في المجالات المحكمة، مما يُعزز نموهم المهني ويسهم في جودة التعليم بشكل عام.
 5. المشاركة في أنشطة خدمة المجتمع: يُشجّع أعضاء هيئة التدريس على المشاركة في أنشطة خدمة المجتمع والتعاون مع المؤسسات الخارجية، مما يُوسّع نطاق تأثيرهم ويثري نموهم المهني.

6. التقييم المستمر والتغذية الراجعة: يُجرى تقييم مستمر لأداء أعضاء هيئة التدريس، إلى جانب تقديم تغذية راجعة دورية للمساعدة في تحسين أدائهم وتطوير مهاراتهم.
7. تقديم الدعم الفني والاستشاري: يُقدم الدعم الفني والاستشاري لأعضاء هيئة التدريس في مجالات متنوعة، مثل تصميم المناهج التعليمية، وتطويرها، واستخدام التكنولوجيا في التعليم.

13. معيار القبول

- تتضمن معايير القبول الجامعي عادةً مجموعة من الأنظمة والإجراءات المتعلقة بالتقديم والتسجيل:
1. المتطلبات الأكاديمية: تشمل هذه المتطلبات المؤهلات الأكاديمية اللازمة للقبول الجامعي، مثل شهادة الثانوية العامة أو ما يعادلها، والنتائج الأكاديمية السابقة.
 2. استمارة طلب الالتحاق: يجب على المتقدمين تقديم استمارة طلب الالتحاق تتضمن معلومات شخصية وأكاديمية، بالإضافة إلى أي معلومات إضافية مطلوبة.
 3. المعايير الصحية والسلوكية: قد تتضمن لوائح المدرسة أو الجامعة معايير صحية وسلوكية يجب على المتقدمين الالتزام بها.
 4. مواعيد التقديم: تحدد المؤسسة التعليمية أو الكلية مواعيد نهائية لتقديم طلبات الالتحاق، ويجب على المتقدمين الالتزام بها.
 5. الرسوم الدراسية والمساعدات المالية: يجب على المتقدمين فهم الرسوم الدراسية والخيارات المتاحة للمساعدات المالية أو القروض الطلابية.

14. أهم مصادر المعلومات عن البرنامج

- تشمل المصادر الرئيسية للمعلومات حول البرنامج الأكاديمي في قسم الجيولوجيا بكلية العلوم، جامعة بغداد، ما يلي:
1. موقع الجامعة الإلكتروني:
 - يوفر موقع الجامعة الإلكتروني معلومات شاملة حول البرامج الأكاديمية المتاحة وشروط التقديم والتسجيل في كلية العلوم، بما في ذلك الجيولوجيا.
 2. موقع الكلية الإلكتروني:

- يحتوي موقع الكلية الإلكتروني على معلومات تفصيلية حول برنامج الجيولوجيا، مثل الخطط الدراسية والشروط والمقررات الدراسية المقدمة.
- 3. دليل البرنامج الأكاديمي:
- يتوفر دليل البرنامج الأكاديمي للجيولوجيا، والذي يحتوي على معلومات تفصيلية حول المناهج الدراسية والشروط والفرص الأكاديمية.
- 4. زيارات الحرم الجامعي:
- يمكن للطلاب الراغبين في الالتحاق ببرنامج الجيولوجيا زيارة الحرم الجامعي والتحدث مع مسؤولي القسم وأعضاء هيئة التدريس والطلاب الحاليين للحصول على معلومات إضافية.
- 5. التواصل المباشر:
- يمكن للطلاب التواصل مباشرة مع إدارة القسم أو المرشدين الأكاديميين لطلب معلومات إضافية والإجابة على استفساراتهم.
- 6. منصات التواصل الاجتماعي:
- قد توفر حسابات الجامعة أو الكلية على مواقع التواصل الاجتماعي معلومات وآراء مفيدة من الطلاب الحاليين حول البرنامج الأكاديمي.
- 7. منتديات الطلاب:
- يمكن للطلاب استكشاف منتديات الطلاب الإلكترونية للاطلاع على آراء وتجارب الطلاب السابقين والحاليين حول برنامج الجيولوجيا.

15. خطة تطوير البرنامج

الرؤية: أن نكون قسمًا رائدًا في مجال الجيولوجيا، تعليمًا وبحثًا، على المستويين الوطني والإقليمي، وأن نساهم في تخريج كوادر متميزة تُسهم في تقدم مجتمعنا وفهم العالم الطبيعي.

الأهداف:

1. تحديث المناهج الدراسية:

- مراجعة وتحديث المناهج الدراسية لمواكبة التطورات العلمية والتقنية في مجال الجيولوجيا.
- إضافة مقررات جديدة تُراعي التحديات والاحتياجات الراهنة في مجال الجيولوجيا.

2. تعزيز الخبرات العملية:

• توفير المزيد من فرص التعلم العملي من خلال الرحلات الميدانية وورش العمل والتجارب المخبرية المتقدمة.

• الاستثمار في تقنيات الواقع الافتراضي والواقع المعزز لإثراء تجربة التعلم.

3. دعم البحث العلمي:

• توفير الدعم المالي والموارد اللازمة للبحث العلمي في مختلف فروع الجيولوجيا.

• تشجيع أعضاء هيئة التدريس والطلاب على المشاركة في المؤتمرات ونشر الأبحاث في المجالات العلمية.

4. تعزيز التعاون مع قطاع الصناعة:

• بناء شراكات مع شركات ومؤسسات القطاع الخاص لتوفير فرص التدريب والتوظيف للطلاب.

• تنظيم ندوات وورش عمل بالتعاون مع قطاع الصناعة لتبادل المعرفة وتعزيز التفاعل.

5. تنمية المهارات الشخصية والاجتماعية:

• توفير برامج تدريبية تهدف إلى تنمية المهارات الشخصية مثل القيادة والتواصل وحل المشكلات.

• تعزيز العمل الجماعي والتفاعل الاجتماعي من خلال المشاريع التعاونية والأنشطة الثقافية والاجتماعية.

الإجراءات المقترحة:

1. إنشاء لجنة للتطوير الأكاديمي مسؤولة عن تنفيذ الخطة ومتابعة التقدم.

2. تشكيل فرق عمل متخصصة لتحديث المناهج الدراسية وتقديم التوصيات.

3. توفير تدريب مستمر لأعضاء هيئة التدريس حول أحدث أساليب التدريس والبحث.

4. إطلاق حملات تسويقية لجذب الطلاب الموهوبين والمهتمين بعلم الجيولوجيا.

تقديم برامج دعم أكاديمي للطلاب لتعزيز نجاحهم الأكاديمي ومساعدتهم على تحقيق أهدافهم المهنية.

مخطط مهارات البرنامج															
مخرجات التعلم المطلوبة من البرنامج															
القيم				المهارات				المعرفة		اساسي أم اختياري	اسم المقرر	رمز المقرر	السنة / المستوى		
ج 4	ج 3	ج 2	ج 1	ب 4	ب 3	ب 2	ب 1	أ 4	أ 3					أ 2	أ 1
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	اساسي	الجيولوجيا الطبيعية	GEO11001	2026/2025 المرحلة الاولى/ الفصل الدراسي الاول
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	اساسي	علم البلورات	GEO11002	
												اساسي	الكيمياء	GEO11003	
												اساسي	اللغة الإنجليزية	UOB102	
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	اساسي	مهارات الحاسوب الأساسية 1	UOB103	
												اساسي	الديمقراطية وحقوق الإنسان	UOB104	
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	اساسي	الجيولوجيا التاريخية	GEO12004	2026/2025 المرحلة الاولى/ الفصل الدراسي الثاني
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	اساسي	علم المعادن	GEO12005	
												اساسي	الفيزياء العامة	GEO12006	
												اساسي	الرياضيات	GEO12007	
												اساسي	اللغة العربية ١	UOB101	
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	اساسي	المتحجرات اللافقارية ١	GEO23008	
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	اساسي	بصرية المعادن	GEO23009	2026/2025 المرحلة الثانية/ الفصل الدراسي الاول
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	اساسي	الجيولوجيا التركيبية ١	GEO23010	
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	اساسي	علم اشكال الأرض	GEO23011	
												اساسي	اللغة الإنجليزية ٢	UOB202	
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	اساسي	الحاسوب ٢	UOB203	
												اساسي	جرائم نظام البعث في العراق	UOB105	
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	اساسي	المتحجرات اللافقارية ٢	GEO24012	2026/2025 المرحلة الثانية/ الفصل الدراسي الثاني
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	اساسي	علم الصخور	GEO24013	
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	اساسي	الجيولوجيا التركيبية ٢	GEO24014	
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	اساسي	الاستشعار عن بعد	GEO24015	
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	اساسي	علم الرسوبيات	GEO24016	
												اساسي	الإحصاء	GEO24017	
												اساسي	اللغة العربية ٢	UOB201	2026/2025 المرحلة الثالثة/ الفصل الدراسي الاول
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	اساسي	المتحجرات الدقيقة	GEO35018	
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	اساسي	الصخور النارية	GEO35019	
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	اساسي	علم الجيوتكتونكس	GEO35020	
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	اساسي	الجيوفيزياء ١ (الطرق الجاذبية والمغناطيسية)	GEO35021	
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	اساسي	علم الطبقات	GEO35022	
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	اساسي	الصخور الرسوبية	GEO35023	2026/2025 المرحلة الثالثة/ الفصل الدراسي الثاني
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	اساسي	البيئة القديمة	GEO36124	
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	اساسي	الصخور المتحولة	GEO36125	
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	اساسي	الجيولوجيا الحقلية	GEO36126	
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	اساسي	الجيوفيزياء ٢ (الطرق الزلزالية والكهربائية)	GEO36027	
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	اساسي	جيولوجيا العراق	GEO36028	
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	اساسي	منهجية البحث	UOB309	2026/2025
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	اساسي	الجيولوجيا الهندسية	GEO4832	

✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	اساسي	جيولوجيا تحت السطح	GEO4833	المرحلة الرابعة/ الفصل الدراسي الاول
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	اساسي	الجيوكيمياء	GEO4834	
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	اساسي	الجيولوجيا البيئية	GEO4835	
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	اساسي	مشروع بحثي ١	GEO4836	
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	اساسي	موارد مائية	GEO4938	المرحلة الرابعة/ الفصل الدراسي الثاني 2026/2025
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	اساسي	جيولوجيا النفط	GEO4939	
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	اساسي	جيولوجيا الخامات	GEO4940	
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	اساسي	التلوث البيئي	GEO4941	
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	اساسي	كورس العمل الحفلي الجيولوجي	GEO4943	
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	اساسي	استكشاف نفطي	GEO4942	
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	اختياري	معالجة اشارات	-	
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	اختياري	طرق اشعاعية	-	

• يرجى وضع اشارة في المربعات المقابلة لمخرجات التعلم الفردية من البرنامج الخاضعة للتقييم



Ministry of Higher Education and
Scientific Research - Iraq
University of Baghdad
College of Sciences
Department of Geology



جامعة بغداد / كلية العلوم

قسم علم الارض

مواد المرحلة الاولى

الفصل الدراسي الاول

و

الفصل الدراسي الثاني

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Physical Geology		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	GEO-11001		
ECTS Credits	9		
SWL (hr/sem)	225		
Module Level	1	Semester of Delivery	1
Administering Department	Geology	College	Science
Module Leader	Dr. Mustafa Ali Hassan	e-mail	Dr.musstafali@gmail.com
Module Leader's Acad. Title	Assistant Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Dr. Murtadha Jabbar	e-mail	murtadha.issa@sc.uobaghdad.edu.iq
Peer Reviewer Name	Prof. Dr. Qusai Yaseen Salman	e-mail	Qusai.Salman@sc.uobaghdad.edu.iq
Scientific Committee Approval Date	01/09/2025	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	physical geology	Semester	1
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1-. Physical geology is defined as one of the branches of earth science that specializes in the study of the solid, non-living features of the planet Earth and other planets. It is done by studying the various rocks, minerals and materials that formed the earth and the processes related to it through time, and employing scientific tools and combined techniques to find out the approximate ages of the rocks on and in the earth's interior, and using this information to determine the history of the earth and the terres it passed through. 2- Providing students with an appropriate amount of information and expertise in the field of geoscience in a functional manner that contributes to the acquisition of a scientific culture and contributes to academic preparation and helps them to identify the natural resources in their country
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Gaining the ability and skill in field interpretation and deduction. 2- Acquiring the skill of distinguishing between different geological features. 3- Dealing with the basic laws of various earth sciences. 4-Using the principle of the past is key to the present
Indicative Contents المحتويات الإرشادية	1-. Physical geology is defined as one of the branches of earth science that specializes in the study of the solid, non-living features of the planet Earth and other planets. It is done by studying the various rocks, minerals and materials that formed the earth and the processes related to it through time, and employing scientific tools and combined techniques to find out the approximate ages of the rocks on and in the earth's interior, and using this information to determine the history of the earth and the terres it passed through. 2- Providing students with an appropriate amount of information and expertise in the field of geoscience in a functional manner that contributes to the acquisition of a scientific culture and contributes to academic preparation and helps them to identify the natural resources in their country 3-Gaining the ability and skill in field interpretation and deduction. 4- Acquiring the skill of distinguishing between different geological features. 5- Dealing with the basic laws of various earth sciences. 6-Using the principle of the past is key to the present

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

1. Fieldwork and Hands-on Experience. Hands-on experience allows students to develop observational skills, make connections between theoretical concepts and real-world examples, and enhance their understanding of stratigraphic principles.
 2. Visual Aids: Utilize visual aids, such as diagrams, charts, maps, and photographs, to help students visualize and comprehend stratigraphic concepts. Use geological maps to demonstrate the distribution and relationships between different rock units and incorporate stratigraphic columns to illustrate the vertical succession of strata.
 3. Virtual Resources: Take advantage of virtual resources, such as interactive online modules, virtual field trips, and digital simulations. These resources can provide students with immersive experiences, allowing them to explore stratigraphic principles and study geological features virtually.
 4. Case Studies and Real-life Examples
 5. Laboratory Work: Conduct laboratory exercises that involve the description and interpretation of rock samples, including the identification of lithology, sedimentary structures, and fossil content. Encourage students to create stratigraphic logs or cross-sections based on the laboratory data, promoting critical thinking.
 6. Collaborative Learning: Foster collaborative learning environments where students can work in groups or pairs to solve problems, analyze data, or interpret stratigraphic information. This approach encourages active engagement, promotes discussions, and allows students to learn from one another's perspectives and insights.
 7. Multimedia Resources: Incorporate multimedia resources, such as videos, animations, and online lectures, to supplement traditional teaching methods. Multimedia resources can help reinforce key concepts, illustrate geological processes, and provide additional visual and auditory learning opportunities.
8. Continuous Assessment and Feedback: Implement regular assessments, such as quizzes, assignments, or class discussions, to gauge student understanding and provide timely feedback. This allows students to monitor their progress, identify areas of improvement, and reinforces learning.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem)	146	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	9

الحمل الدراسي غير المنتظم للطلاب خلال الفصل		
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	225	

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 8
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 9 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	8	LO # 1-7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction- physical geology
Week 2	The importance of geology A brief summary of history of geology
Week 3	Branches of the geology Relationship between geology and other sciences
Week 4	The earth and the Solar System
Week 5	Crystals and crystallography(Crystals: (Introduction, Lattices Crystal,Crystals properties)
Week 6	Crystal symmetry, Elements of symmetry, Crystallographic axes, Crystal systems, System of the crystals)
Week 7	Crystals and crystallography(Crystals: (Introduction, Lattices Crystal,Crystals properties)Crystal symmetry, Elements of symmetry, Crystallographic axes, Crystal systems, System of the crystals)
Week 8	Midterm Exam
Week 9	Minerals: (Introduction, Minerals groups,Physical properties of minerals,) Economic use of Minerals
Week 10	Petrology I Igneous rocks (Introduction to

Week 11	Petrology II Sedimentary rocks (Introduction to sedimentary rocks, Types of sedimentary rocks, Sedimentary environments)
Week 12	Petrology III Metamorphic rocks (Introduction to metamorphic rocks, Agents of metamorphism, Textural and mineralogical changes)
Week 13	Surface Water
Week 14	Groundwater
Week 15	Weathering and soil
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Crystals
Week 2	Lab 2: Crystals properties
Week 3	Lab 3: Crystal symmetry, Elements of symmetry, Crystallographic axes, Crystal systems, System of the crystals
Week 4	Lab 4 Crystal symmetry, Elements of symmetry, Crystallographic axes, Crystal systems, System of the crystals
Week 5	Lab 5: Crystal symmetry, Elements of symmetry, Crystallographic axes, Crystal systems, System of the crystals
Week 6	Lab 6: Physical properties of minerals
Week 7	Lab 7: Physical properties of minerals
Week 8	Midterm Exam
Week 9	Lab 9 Igneous rocks
Week 10	Lab 10: Igneous rocks
Week 11	Lab 11: Sedimentary rocks
Week 12	Lab 12: Sedimentary rocks
Week 13	Lab 13: Metamorphic rocks
Week 14	Lab 14 Metamorphic rocks

Week 15	Lab 15 Comprehensive laboratory review
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Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	1. Physical Geology First University of 1. 9102 Saskatchewan Edition, 2. Physical geology–Laboratory manuals.	Yes
Recommended Texts	2015 مبادئ علم الارض للدكتور سعد الدهان .	No
Websites		

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Crystallography		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	GEO-11002		
ECTS Credits	9		
SWL (hr/sem)	225		
Module Level	1	Semester of Delivery	1
Administering Department	Geology	College	Science
Module Leader	Dr. Hiba Saadon	e-mail	hiba.saadon@sc.uobaghdad.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor	Dr. Luma Jasem	e-mail	luma.riadh@sc.uobaghdad.edu.iq
Peer Reviewer Name	Prof. Dr. Aiad Ali Hussien	e-mail	aiad.hussien@sc.uobaghdad.edu.iq
Scientific Committee Approval Date	01/09/2025	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module		Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. Crystals aims to define how minerals crystallize in nature and what are the methods of crystallization that occur in nature through which minerals will be formed and these minerals will form rocks in nature Training students on how to take field models and convert them into applied products used in making geological maps. 2. Training students to identify the types of bodies that crystals take upon crystallization, and try to benefit from them in diagnosing minerals
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Gain experience in the process of studying the shapes of crystals. 2. Attempting to diagnose crystal parts and crystal systems. 3. Training to identify the elements of symmetry in the crystal 4. Benefit from the study of crystallography and its use in the processes of diagnosing minerals
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. We have introduced you to the basic principles of crystallography . Let us now summarize what you have learned in this unit; 1- Crystallography aims to know how and how crystals are formed in nature 2- Crystallography is closely related to mineralogy, as it is considered one of the branches of mineralogy, and this science is important, especially in mineral diagnostic processes that have many applications, especially in the classification of rocks, as well as the diagnosis of minerals of economic importance 3- Crystallography has many important applications, especially in the detection and determination of crystalline and amorphous chemical substances

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	When it comes to learning and teaching crystallography , it is important to employ various strategies that cater to different learning styles and maximize understanding and retention. Here are some effective learning and teaching Crystallography : 1- Identify the models of crystals that are used in the laboratory and their relationship with real crystals of minerals in nature 2- Understand the ways in which minerals crystallize, which will vary according to the processes by which the types of igneous, sedimentary, and metamorphic rocks are formed. 3- After understanding the crystallization processes and the different bodies and shapes of the crystals, the link is made with the crystals of natural minerals, which will be seen in field work and in nature sometimes. 4- Absorbing and understanding crystallography will have many industrial and economic applications, as it is possible to go to what is known as industrial minerals and how to crystallize them in a laboratory.
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Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	146	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	9
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	225		

Module Evaluation

تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 8
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 9 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	8	LO # 1-7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to Crystallography
Week 2	Methods of Crystallization
Week 3	Form and Habits of Crystals
Week 4	Parts of Crystals
Week 5	Symmetry of Crystals
Week 6	Face intercepts
Week 7	32 Crystal Classes
Week 8	Midterm Exam

Week 9	Triclinic and monoclinic Systems
Week 10	Orthorhombic and tetragonal Systems
Week 11	Hexagonal and Trigonal Systems
Week 12	Cubic System
Week 13	Stereographic Projection of Crystals
Week 14	Crystal Drawings
Week 15	Internal Structure of Crystals
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Introduction to Crystallography
Week 2	Lab 2: Parts of Crystals
Week 3	Lab 3: Crystallographic Systems
Week 4	Lab 4: Symmetry of Crystals, Elements and Operation of Crystals
Week 5	Lab 5: Forms of Crystals
Week 6	Lab 6: 32 Crystal Classes
Week 7	Lab 7: Pinacoidal Class – Triclinic System and Prismatic Class – Monoclinic System
Week 8	Midterm Exam
Week 9	Lab 9: Orthorhombic Dipyramidal Class – Orthorhombic System
Week 10	Lab 10: Ditetragonal Dipyramidal Class – Tetragonal System
Week 11	Lab 11: Dihexagonal Dipyramidal Class – Hexagonal System

Week 12	Lab 12: Scalenohedral class – Trigonal System
Week 13	Lab 13: Hexaoctahedral Class – Cubic System
Week 14	Lab 14: Hexahetradral Class – Cubic System
Week 15	Lab 15: Diploidal Class – Cubic System

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Philip, F. C., 1971, An Introduction to Crystallography, 4th edition, Longman Group Ltd, United Kingdom, 349P.	Yes
Recommended Texts	Al-Kufaishi, F, A,. and Mahmood, M, M.,1989, Crystallography, Mosul University Prints, (In Arabic), 352P.	Yes
Websites	www.Mindat.com	

Grading Scheme				
مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Chemistry		Module Delivery
Module Type	B	☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	GEO-11003		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	1	Semester of Delivery	1
Administering Department	Chemistry	College	Science
Module Leader	Dr.Shurooq Badri Al-badri	e-mail	s.b.albadr@sc.uobaghdad.edu.iq
Module Leader's Acad. Title	Assistant professor	Module Leader's Qualification	Ph.D.
Module Tutor	Dr.Shurooq Badri Al-badri	e-mail	s.b.albadri@sc.uobaghdad.edu.iq
Peer Reviewer Name	Prof. Dr. Salih Muhammad Awadh	e-mail	salih.awadh@sc.uobaghdad.edu.iq
Scientific Committee ApprovalDate	01/09/2025	Version Number	

Relation with other Modules			
العلاقة مع المواد الدراسية الاخرى			
Prerequisite module		Semester	
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	1. Provide students with a comprehensive understanding of the fundamental principles underlying volumetric analysis and quantitative analysis methods. As well as general knowledge in both Organic Chemistry and Biochemistry. 2. Develop specialists in the field of general chemistry and its practical applications, preparing them to fulfill the country's developmental and industrial needs. 3. Foster a scientifically literate generation that recognizes the value of science as a catalyst for transformative change. This includes cultivating critical thinking skills, promoting analytical thinking, and facilitating adaptability to evolving technologies and societal demands. 4. Strengthen the connection between the university and society by offering advisory counseling, training programs, and professional development opportunities for faculty and staff, ensuring that academic knowledge is effectively applied to real-world contexts. 5. Contribute to the country's overall progress by producing chemistry graduates who possess the skills and knowledge to actively contribute to its development. 6. Address the increasing demand for highly qualified professionals in various sectors that require specialized expertise in chemistry. 7. Encourage exceptional students to serve as teaching assistants within the department, nurturing their potential to become future members of the academic teaching staff and fostering the growth of a knowledgeable and skilled workforce
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	A. Cognitive goals 1- Introduce students to the fundamental principles of volumetric analysis and quantitative analysis methods, establishing a solid foundation in the field. 2- Foster an understanding of the theoretical principles and practical applications of titration, enabling students to detect both inorganic and organic compounds effectively. 3- Provide students with a comprehensive knowledge of volumetric analysis, with a specific focus on titration, and its extensive range of applications in various scientific disciplines. 4- Provide students knowledge of definition of organic chemistry, the classification of organic compounds, how to distinguish between them, and a method. As well as how given the name to organic compound. 5- Provide students' knowledge of biochemistry, the basic elements of life, and the structure and components of a cell.as well as the types of carbohydrates, fats, proteins and nucleic acids. A. The skills goals special to the program 1- Enhance students' research skills by encouraging them to engage in scientific exploration and facilitating constructive discussions where informed opinions are shared. 2- Develop proficiency in the use and development of laboratory techniques and equipment, enabling students to conduct experiments effectively and obtain accurate results. 3- Cultivate critical thinking skills that allow students to analyze and solve scientific problems related to the laws of chemistry, promoting a deeper understanding of the subject.

	4- Foster the development of practical skills and the ability to apply theoretical and empirical scientific knowledge gained through their studies in real-life situations, taking into account industrial and commercial constraints.
Indicative Contents المحتويات الإرشادية	The course aims to provide students with a comprehensive understanding of classical titration methods in analytical chemistry. It covers the fundamental principles of acid/base titration, complexometric titration, redox titration, and precipitation titration. Students will delve into the theory behind these methods and explore their wide-ranging applications. In addition to theoretical knowledge, the course emphasizes practical skills. Students will learn how to calculate pH values for various acids, bases, salts, and buffers, enabling them to make accurate determinations in real-world scenarios. They will also develop the ability to evaluate and interpret the results obtained from titration experiments, enhancing their analytical capabilities. Throughout the course, selected classical quantitative analytical methods will be highlighted, giving students a deeper understanding of their importance and practical use. By the end of the course, students will have gained the necessary knowledge and skills to apply classical titration methods effectively in analytical chemistry, both in theory and practice.

Learning and Teaching Strategies

إستراتيجيات التعلم والتعليم

Strategies	The module will be conducted using a student-centered approach, placing emphasis on active participation and the cultivation of critical thinking skills. Through a combination of classes, interactive tutorials, and purposeful experiments, students will be actively engaged in the learning process, fostering the development of their critical thinking abilities. The aim is to create an interactive and dynamic learning environment that encourages students to actively participate, think critically, and attain a profound comprehension of the subject matter. By adopting this strategy, students will have the opportunity to apply their knowledge, engage in analytical discussions, and enhance their overall learning experience.
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Student Workload (SWL)

المل الدراسي للطلاب محسوب لـ ١٥ أسبوعا

Structured SWL (h/sem) العمل الدراسي المنتظم للطلاب خلال الاسبوع	79	Structured SWL (h/w) العمل الدراسي المنتظم للطلاب اسبوعيا	5
Unstructured SWL (h/sem) العمل الدراسي غير المنتظم للطلاب خلال الاسبوع	46	Unstructured SWL (h/w) العمل الدراسي غير المنتظم للطلاب اسبوعيا	2.87
Total SWL (h/sem) العمل الدراسي للطلاب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative	Quizzes	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Report	1	10% (10)	13	LO #5, #9 and #10

assessment	Projects / Lab.	1	10% (10)	Continuous	All
Summative assessment	Midterm Exam	2hr	10% (10)	8	LO #1 - #7
	Final ExamLab	1hr	20% (20)	16	All
	Final Exam Theory	3hr	40% (40)	16	
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	General introduction, what is chemistry and its branches? Branches of analytical chemistry, Quantitative analysis, Qualitative analysis.
Week 2	Weight and concentration units, Concentration, The mole, Examples, Molarity, Normality, Percent concentrations, Part per million,
Week 3	Calculations of equivalent weight, Converting of percentage to molarity. The dilute solution Preparation of solid materials solutions, Preparation of liquid materials solutions
Week 4	Chemical equilibrium, Types of equilibrium, Equilibrium constants (Ionic -product constant of water. Solubility and Solubility product constant, examples, calculations.
Week 5	Dissociation of a weak acid or base, Hydrolysis constant (K _H),
Week 6	Volumetric Methods of Analysis, Requirements for a primary standard, Volumetric Calculations for Acid-Base Titrations.
Week 7	Equilibrium in acid-base solutions, Calculating the pH of weak acids and base solutions, Calculating the pH of salts solutions, 1-Salt differential from strong acid and strong base.
Week 8	Mid Term Exam 1
Week 9	2-Salt differential from weak acid and strong base, 3-Salt differential from strong acid and weak base, 4-Salt differential from weak acid and weak base.
Week 10	Buffer Solutions, Calculating the pH of Buffer solutions, Buffer capacity, Acid – Base Titration, Acid – Base Indicators, Methyl Orange, Phenolphthalein .
Week 11	Titration of a Weak Acid with a Strong base, Differential titration, Titration mixtures of two acids, Titration one Base or Mixture of two Bases with Strong Acid.
Week 12	Introduction to Organic Chemistry, and Classes of Organic compound.
Week 13	Chemistry of the Functional Groups (Alcohols ,Aldehydes and Ketones, and Carboxylic Acids)
Week 14	General introduction, in Biochemistry
Week 15	Mid Term Exam 2

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Learn about laboratory tools and equipment and how to use them
Week 2	Learn the principles of descriptive analysis and the descriptive interactions of the first group of ions
Week 3	A test on the analysis of information samples for the first group, based on the descriptive analysis
Week 4	A test on the analysis of the anonymous samples of the first group, based on the descriptive analysis

Week 5	Characteristic descriptive interactions of the second group ions
Week 6	A test on the analysis of the known samples of the second group
Week 7	A test on the analysis of anonymous samples of the second group
Week 8	Calculations of volumetric analysis, preparation of approximately (0.1N) HCl and (0.1N) sodium carbonate, Standardization of HCl solution with standard solution of Na ₂ CO ₃ .
Week 9	Unknown solution: Practical exam.
Week 10	Analysis of a mixture (sodium hydroxide + sodium carbonate)
Week 11	Analysis of a mixture (sodium bicarbonate + sodium carbonate)
Week 12	Oxidation-reduction reactions, A: Preparation of 0.1N potassium permanganate, Preparation of 0.1 N sodium oxalate (Na ₂ C ₂ O ₄).
Week 13	Determination the concentration of ferrous ion.
Week 14	Complexometric titration, Determination of total hardness (permanent and temporary) of water

Learning and Teaching Resources		
مصادر التعلم والتدريس		
References	Text	Available in the Library?
Required Texts	Fundamental of analytical chemistry by Skoog, West, Holler & Crouch, 8th, 2004.	Yes
Recommended Texts	1-Fundamental of analytical chemistry by Skoog, West, Holler, 6 th , 1992. 2-Principles of instrumental analysis by Skoog, West, Holler & Crouch, 8 th , 2004. 3-K. Burger D, Sc, "Organic reagents in metal analysis", 1 st , New York, 1973. 4- General Chemistry: The Essential Concepts 5th Edition by Raymond Chang	
Websites	https://www.goodreads.com/book/show/1568659.General_Chemistry	

Grading Scheme				
مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings

	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	English Language I		Module Delivery
Module Type	B		☒ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	UOB-102		
ECTS Credits	2		
SWL (hr/sem)	50		
Module Level	1	Semester of Delivery	1
Administering Department	Geology	College	Science
Module Leader	Dr. Muhammed Hassan	e-mail	mohammed.nasser@sc.uobaghdad.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor		e-mail	
Peer Reviewer Name	Prof. Dr. Moutaz Abd Alstar Mohammed	e-mail	Moutaz.mohammed@sc.uobaghdad.edu.iq
Scientific Committee Approval Date	01/09/2025	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module		Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Raise the level of English language for the students, and help the student to improve their English language(speaking and writing). 2. Helping students to speak in English. 3. Training the student on writing different geologic subjects in English.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Increasing the ability of student to apply what they learned from the grammar lecture in their writing. 2. Increasing the ability of student to apply what they learned from the grammar lecture in their speaking. 3. Encourage students to read and understand geologic papers in English.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. We have introduced you to the basic principles of stratigraphy. Let us now summarize what you have learned in this unit; 1.Learning English Can Help student to think More Creatively An additional language will increase your creativity levels. In the fifth benefit on our list, we pointed out the fact learning a second language can make the brain becomes more flexible thereby making it easier to switch between different tasks, promoting creativity 2. Learning English Can Help studentsIn Academia A science-based article recently revealed that the number of scientific papers written in English is now outnumbering those written in the researcher's native language. Therefore, having an understanding of the English language opens up a vast amount of knowledge that can be drawn upon during their studies.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	One of the primary benefits of learning English is that it is often considered the language of global business. The international business community often uses it for

	communication, even among people who do not speak the same native language. Speaking and understanding English can let a person more easily communicate with others and find more job opportunities not only in his or her home country, but around the world as well. There are also many professional informative publications printed in English, which means it is often an essential language for anyone working in science or research. Different learning styles could be applied in the class to improve the english language for the student. 1. Divide the students into a number of groups and choose a geologic subject to discuss in English. 2. Listen to different types of lectures recorded in English to improve the students listening 3. Ask the student to prepare a short geologic report written in English in the class to evaluate their level in writing.
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Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	50		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 8
	Projects / Lab.	1	10% (10)	Continuous	All

	Report	1	10% (10)	13	LO # 5, 9 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	8	LO # 1-7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Present perfect simple Explain the structure of this tense and when to use it with examples
Week 2	Past perfect simple Explain the structure of this tense and when to use it with examples
Week 3	Words used with the present perfect: ever, never, before
Week 4	Present perfect continuous Explain the structure of this tense and when to use it with examples
Week 5	Past perfect continuous Explain the structure of this tense and when to use it with examples
Week 6	Speaking lesson In this lecture students are divided into two groups and we discuss any geological subject in English to practice their speaking.
Week 7	Quantifiers: much/many/a lot of
Week 8	Midterm Exam
Week 9	Linking words in writing Define the types of linking word and when to use each word

Week 10	Writing Lesson Each student chooses a geological subject and the write a short paragraph.
Week 11	Preposition This lecture include two types of preposition word with different examples
Week 12	
Week 13	
Week 14	
Week 15	
Week 16	Preparatory week before the final Exam

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Computer I		Module Delivery
Module Type	B		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	UOB-103		
ECTS Credits	3		
SWL (hr/sem)	75		
Module Level	1	Semester of Delivery	1
Administering Department	Geology	College	Science
Module Leader	Dr. Omar Fitian	e-mail	omar.f@sc.uobaghdad.edu.iq
Module Leader's Acad. Title	Assistant Prof.	Module Leader's Qualification	PhD
Module Tutor	Abdullah Adil	e-mail	abdullah.i@sc.uobaghdad.edu.iq
Peer Reviewer Name	Prof. Dr. Ali Maki Al-Rahim	e-mail	ali.m@sc.uobaghdad.edu.iq
Scientific Committee Approval Date	01/09/2025	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims	1. Operating System Proficiency: Understanding computer windows, such as Microsoft Windows, allows you to navigate and manage your computer effectively. You can learn how to interact with the graphical user interface,

أهداف المادة الدراسية	customize settings, manage files and folders, install and uninstall applications, troubleshoot common issues, and ensure overall system security. 2. Productivity Enhancement: Microsoft Word is a widely used word processing software that can help you create professional documents, such as reports, essays, letters, resumes, and more. By learning Microsoft Word, you can improve your typing and formatting skills, utilize features like spell check and grammar check, insert images and tables, create headers and footers, use styles and formatting options, and collaborate with others on documents. 3. Career Advancement: Proficiency in computer windows and Microsoft Word is often expected in many workplaces. By learning these tools, you can enhance your employability and increase your chances of success in various fields, including administration, data entry, content creation, customer support, and more. Knowledge of these tools may also be required for specific job roles or industry certifications. 4. Academic Pursuits: Students often need to use computer windows and Microsoft Word for their academic work. Learning these tools can help you create well-structured documents, format citations and references, organize research materials, collaborate on group projects, and effectively manage your academic workload. 5. Personal Use: Even outside of work or academia, learning about computer windows and Microsoft Word can benefit you in your personal life. You can use these tools for creating invitations, writing personal letters, designing newsletters, maintaining personal budgets, and more. They provide you with the skills to be more efficient and organized in various day-to-day tasks.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Learning outcomes for Microsoft Windows: 1. Basic Navigation: Students will be able to navigate the Windows operating system, including using the Start menu, taskbar, and file explorer to locate and manage files and applications. 2. File Management: Students will learn how to create, rename, copy, move, and delete files and folders, as well as how to organize their files using folders and subfolders. 3. System Settings: Students will understand how to customize and adjust system settings such as display resolution, desktop backgrounds, screen savers, power settings, and sound preferences. 4. Application Management: Students will be able to install, update, and uninstall applications from the Microsoft Store and third-party sources, as well as manage application shortcuts and configure default applications. 5. Internet and Network Connectivity: Students will learn how to connect to Wi-Fi networks, manage network connections, and troubleshoot common internet connectivity issues. 6. System Security: Students will understand the importance of system security and learn how to use built-in Windows features like Windows Defender to protect their computer from malware and other security threats. Learning outcomes for Microsoft Word: 1. Document Creation: Students will be able to create, open, and save documents using Microsoft Word, including understanding different file formats and choosing appropriate file names and locations. 2. Formatting and Styling: Students will learn how to format text, paragraphs,

	and pages, including adjusting font styles, sizes, and colors, applying different types of alignments, adding headers and footers, and setting up page numbering. 3. Editing and Proofreading: Students will develop skills in editing and proofreading documents, including using features like spell check, grammar check, thesaurus, and word count to ensure accuracy and clarity in their writing. 4. Document Organization: Students will understand how to organize their documents using features such as headings, subheadings, bulleted and numbered lists, tables, and page breaks to create a clear and well-structured document. 5. Inserting and Formatting Graphics: Students will learn how to insert and manipulate images, shapes, and other graphical elements into their documents, as well as adjust their size, position, and text wrapping options. 6. Citing a references: Students will learn how to manage document references by using the tools like insert citation, insert captions, footnote, endnote, and table of contents.
Indicative Contents المحتويات الإرشادية	Indicative contents of learning Microsoft Windows: 1. Introduction to Microsoft Windows • Overview of the Windows operating system • Evolution of Windows versions 2. Windows Interface and Navigation • Start menu and taskbar • File Explorer and file management • Desktop customization and personalization 3. System Settings and Control Panel • Display settings and resolution • Power and sleep settings • Sound and volume control • Device management and drivers 4. Application Management • Installing and uninstalling applications • Microsoft Store and third-party applications • Managing application shortcuts and default programs 5. Internet and Network Connectivity • Connecting to Wi-Fi networks • Network and internet settings • Troubleshooting internet connection issues 6. System Security • Introduction to system security • Windows Defender and antivirus protection • User account management and password security Indicative contents of learning Microsoft Word: 1. Introduction to Microsoft Word • Overview of Word's features and capabilities

	• Understanding the Word interface and ribbon 2. Document Creation and Formatting • Creating, opening, and saving documents • Text formatting (font styles, sizes, colors) • Paragraph formatting (alignment, indentation, spacing) • Page formatting (margins, orientation, page breaks) 3. Editing and Proofreading • Spell check and grammar check • AutoCorrect and AutoFormat features • Thesaurus and word count tools • Tracking changes and reviewing documents 4. Document Organization and Navigation • Headings and styles • Table of contents and navigation pane • Creating and managing sections and headers/footers • Bookmarks and hyperlinks 5. Inserting and Formatting Graphics • Inserting images and resizing options • Shapes, symbols, and icons • SmartArt graphics and charts • Text wrapping and alignment with graphics 6. Citation and References • Insert citation, caption, footnote, and endnote • Manage sources and bibliography • Table of contents and table of figures
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Hands-on Practice: Emphasize practical exercises and hands-on activities where learners actively engage with the software. Provide step-by-step instructions and guided practice opportunities to ensure learners gain experience. 2. Demonstration: Start by demonstrating key features and functionalities of Windows and Word. Use screen sharing or projection to show learners how to navigate the interface, perform tasks, and utilize various tools and options effectively. 3. Interactive Tutorials and Simulations: Utilize interactive tutorials and simulations that allow learners to interact in a simulated environment. These resources provide guided instructions and immediate feedback, enabling learners to practice and reinforce their skills. 4. Scenario-based Learning: Present real-life scenarios where learners can apply their knowledge to solve problems or complete specific tasks. Encourage

	critical thinking and problem-solving skills by challenging learners to find solutions using the software. 5. Group Activities and Discussions: Foster collaboration and peer learning by incorporating group activities and discussions. Encourage learners to share their experiences, ask questions, and help each other troubleshoot issues or explore advanced features. 6. Multimedia Resources: Supplement traditional instruction with multimedia resources such as video tutorials, interactive e-learning modules, and online resources. These resources can provide additional explanations, demonstrations, and visual aids to enhance understanding and retention of the content. 7. Practice Projects and Assignments: Assign practical projects or assignments that require learners to apply their skills to create documents, presentations, or other tasks. Provide clear objectives and guidelines, and encourage creativity to promote active learning. 8. Assessments and Feedback: Use formative and summative assessments to gauge learners' understanding and progress. Provide constructive feedback on their work to highlight areas for improvement and reinforce correct practices. 9. Adaptability and Differentiation: Recognize the diverse needs and learning styles of learners and adapt the instruction accordingly. Provide differentiated instruction, additional resources, or alternative learning paths to cater to individual learners' abilities and preferences.
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Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	49	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	26	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	75		

Module Evaluation تقييم المادة الدراسية				
	Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome

Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 8
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 9 and 10
Summative assessment	Midterm Exam	2hr	10% (10)	8	LO # 1-7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab1: Windows 10 Introduction
Week 2	Lab2: Windows 10 Start Menu
Week 3	Lab3: Windows 10 Taskbar
Week 4	Lab4: Windows 10 File Explorer
Week 5	Lab5: Windows 10 File Explorer - 2
Week 6	Lab6: Windows 10 - Settings
Week 7	Lab7: Word 2016 File Tab
Week 8	Midterm Exam
Week 9	Lab8: Word 2016 Home Tab

Week 10	Lab9: Word 2016 Insert Tab
Week 11	Lab10: Word 2016 Table Design and Layout Tab
Week 12	Lab11: Word 2016 Design + Layout Tab
Week 13	Lab12: Word 2016 References Tab
Week 14	Lab13: Word 2016 References Tab II
Week 15	Lab14: Word 2016 Review + View Tab
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	1. Windows 10 quick reference 2. Word 2016 quick reference	No
Recommended Texts		No
Websites	The official Microsoft Support website https://support.microsoft.com/en-us My official youtube channel https://www.youtube.com/channel/UCZRoVqavqTqM9kd9cQ8DUFg	

Grading Scheme				
مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information					
معلومات المادة الدراسية					
Module Title	Democracy and Human Rights			Module Delivery	
Module Type	B			☒ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	UOB-104				
ECTS Credits	2				
SWL (hr/sem)	50				
Module Level	1	Semester of Delivery			
Administering Department	GEO		College	UOB	
Module Leader	Ansam Faik Abdul - Rezzak Al-Obidi		e-mail	ansam.faik@sc.uobaghdad.edu.iq	
Module Leader's Acad. Title	Lecturer		Module Leader's Qualification	M.Sc.	
Module Tutor	None		e-mail	None	
Peer Reviewer Name	Prof. Dr. Ahmed Shehab		e-mail	Ahmed.Ahmed@sc.uobaghdad.edu.iq	
Review Committee Approval	01/09/2025		Version Number	1.0	
Relation With Other Modules					
العلاقة مع المواد الدراسية الأخرى					
Prerequisite module	None			Semester	

Co-requisites module	None	Semester	
Module Aims, Learning Outcomes and Indicative Contents			
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية			

Module Aims أهداف المادة الدراسية	1. This course deals with the basic concept of human rights& democracy 2. Clarifying and training students on the most important principles of human rights and democracy. 3. Organizing discussions and presentations on the most vital and basic topics affecting community building, related to human rights and democracy.. 4. Adopting teamwork with students to develop their cognitive abilities and create a spirit of cooperation, initiative, creativity and exchange of views in an effort to build the foundations of peaceful community coexistence. 5. Providing society with conscious youth aware of the importance of its role in building society, its unity and cohesion through spreading the culture of human rights and establishing the rules of correct democracy. 6. Human rights guarantee the protection and respect of an individual's interests, even when he or she is not a majority. In a democratic climate, sustainable democratic power cannot be conceived without respecting, protecting and fulfilling human rights. Through their combined influence, they allow the individual a life based on the freedom of self-determination and collective. That is why the protection and realization of human rights truly form the basis of the democratic project.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Cognitive goals. 1. Educate students and inform them about the importance of human rights and democracy. 2. Recognize and understand the methods of teamwork for the exchange of ideas and creative discussions 3. Developing students' performance through guidance in preparing mini-research on modern vocabulary on vital topics related to human rights and democracy. 4. Providing students with creative development abilities in modern proposals and creative developmental ideas by discussing awareness videos presented on electronic classes. 5. Developing the skills of sharing opinions and ideas and respecting others opinion. 6. Objective Skills : 7. Basic knowledge in the principles of human rights and democracy.

	8. Building the innovative personality of knowledge through online research and the transfer and exchange of information. 9. Discuss the various properties about everything related to human rights and their importance in our daily lives. 10. Identify everything related to democracy and the foundations of the performance of the electoral process and its importance in building the nation. 11. Identify the capacitor and inductor phasor relationship with respect to voltage and current.
Indicative Contents المحتويات الإرشادية	- Developing the student's analytical and critical skills regarding the reality and future of human rights and democracy - Training the student on the importance of active participation in aspects of public life, such as promoting respect for the principles of public human rights and active participation in political and cultural life. - Enable students to understand the importance of education and its role in spreading the culture of human rights and democracy in building a civilized society based on good governance, the most important component of which is belief in human rights, education and active participation in governance through free and fair elections.
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the discussions, dialogues and group work lectures & exercises, while at the same time refining and expanding their critical thinking skills. There are many teaching and learning methods used, and the most important of these methods are: Theoretical lecture, discussion and dialogue, panel discussions on certain topics, theoretical student research Library and electronic activities (which helps students to reach the following results: 1- The scientific ability to distinguish between correct information and wrong information. 2- Ease of scientific drafting and ease of correction. 3. Ability to memorize and guess. 4- The ability to link concepts and principles with reality. 5. Ability to invoke, link, interpret.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	2

Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	50		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Attending lectures	1	1%	1.5	41#15 weeks
	Report	1	10% (10)	13	LO # 5, 9 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	8	LO # 1-7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري مادة حقوق الانسان و الديمقراطية	
	Material Covered <u>Human rights & Democracy</u>
Week 1	Familiarity with the concept of human rights and the definitions approaching it, discussing, dismantling and criticizing them in a scientific way in order to reach the most accurate and objective. - Definition of right , of human, of the concept of human rights. Human rights qualities, Types of human rights Human Rights Categories
Week 2	The historical development of human rights: Orcagina Reforms 1- Urnamo Law.2- The law of Ishtar Bit. 3- The law of the Kingdom of Eshnuna.4- Code of Hammurabi.
Week 3	Human rights in other ancient civilizations: 1- Indian and Chinese civilization 2Pharaonic civilization of Egypt 3- Greek civilization 4- Roman civilization
Week 4	Human rights in heavenly laws Human Rights in Judaism, Human rights in Christianity, Human Rights in Islam.
Week 5	Human rights in Renaissance - modern and contemporary societies Introducing the student to the most important UN document in the field of human rights, which was approved and approved by the Assembly on January 10, 1948
	Universal Declaration of Human Rights 1948.
Week 6	Non-governmental organizations defending human rights: Amnesty International, b. International Committee of the Red Cross. Arab Organization for Human Rights.

Week 7	Definition of the phenomenon of administrative corruption, Types of administrative corruption, Causes of administrative corruption. The repercussions of the phenomenon of administrative corruption on human rights and society. Successful treatments to combat corruption and protect society from it.
Week 8	Introduction - Historical development of the concept <u>of democracy</u> , definition of democracy, freedom. The difference between freedom and democracy, The relationship between the rights and public freedoms of individuals and democracy, Islamic views in a democratic system of government , Shura and Democratic System
Week 9	Specifications and duties of the Islamic ruler reading, The era of Imam Ali "peace be upon him" to his governor over Egypt: Specifications of the Islamic ruler: First: The moral and doctrinal components of the ruler Second: The general culture of the Islamic ruler, Third: Acumen and good choice: -Fourth: Direct relationship with people: Fourth: Direct relationship with people. Duties of the Islamic ruler: First: Social Reform: Second: Achieving security and defense Third: The architecture of the country "economic development"
Week 10	Forms of democracy: (1): Direct democracy ,(2): Semi-direct democracy , (3): Parliamentary democracy (parliamentary representation)4): Liberal Democracy (5): consociation Democracy, (6): Delegated Democracy.
Week 11	Conditions for the success of the elements and pillars of the democratic system General conditions for the success of the democratic system: 1. Respect for human rights, 2. Political pluralism 3. Peaceful transfer of power 4. Political equality 5. Respect the principle of the majority 6. Existence of the rule of law.
Week 12	Components or elements of democracy: 1 – Citizenship 2- Political participation 3. Elections 4. MPs and Responsibility 5. Opposition 6- Separation of government and parliament 7- Constitutional legitimacy
Week 13	The concept of elections and their legal adaptation: First: The concept of election Second: Legal adaptation of the Election, Third: Conditions of Election, Fourth: Concepts of Elections, Fifth: Types of Electoral Systems. Assessing the Democratic System, Pros and advantages of the democratic system, Disadvantages and disadvantages of the democratic system, Implementing the democratic system in Iraq.
Week 14	Lobbyists: First: the concept and definition. Second: Types of pressure groups. Third: The methods of pressure groups that they use to achieve their goals. Fourth: Lobbying and Democracy.
Week 15	Preparatory Week
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus) المناهج الاسبوعي للمختبر	
	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Martyrdom verses from the Holy Quran Mohammed Al-Tarawneh et al., International Humanitarian Law, ICRC, Amman, 2005 Diamond Larry, Democracy: Its Development and Ways to Enhance It, translated by Fawzia Naji, Dar Al-Mamoun for Translation, Iraq, 2005.	Yes
Recommended Texts	journal.un.org Hadi, Riad Azabz. (2005). Human rights (evolving contents and protection) (Baghdad).	Yes
Websites	Universal Declaration of Human Rights United Nations https://sc.uobaghdad.edu.iq/?page_id=8415 https://www.youtube.com/@ansamalobidimanagerofhuman2891	

GRADING SCHEME مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				
NB Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				



Ministry of Higher Education and
Scientific Research - Iraq
University of Baghdad
College of Sciences
Department of Geology



جامعة بغداد / كلية العلوم
قسم علم الارض
مواد المرحلة الاولى
الفصل الدراسي الثاني

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Historical Geology		Module Delivery	
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	GEO-12004			
ECTS Credits	9			
SWL (hr/sem)	225			
Module Level	1	Semester of Delivery		2
Administering Department	Geology	College	Science	
Module Leader	Dr. Mustafa Ali Hassan		e-mail	Dr.musstafali@gmail.com
Module Leader's Acad. Title	Assistant Professor		Module Leader's Qualification	Ph.D.
Module Tutor	Dr. Ahmed Kadhim		e-mail	ahmedobaid@uobaghdad.edu.iq
Peer Reviewer Name	Prof. Dr. Salam Ismael Marhoon		e-mail	salam.marhoon@sc.uobaghdad.edu.iq
Scientific Committee Approval Date	01/10/2025	Version Number	1.0	

Relation with other Modules				
العلاقة مع المواد الدراسية الأخرى				
Prerequisite module	Historical geology		Semester	2
Co-requisites module	None		Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1 Historical geology is the use of the principles of geology to reconstruct and understand the history of the Earth. It focuses on the geological processes that change the Earth's surface and core, and uses stratigraphy, structural geology, and paleobiology to identify the sequence of these events.2- Providing students with an appropriate amount of information and expertise in the field of geoscience in a functional manner that contributes to the acquisition of a scientific culture and contributes to academic preparation and helps them to identify the natural resources in their country 2- It includes the study of the changes that occurred on the earth's surface in terms of water distribution and land areas since its inception Earth from about 6.4 billion years ago until now. 3- The study of the Earth's relations with the solar system and the universe, as this section means by studying the effects and remains of ancient life on Earth Earth since the emergence of life about two billion years ago to the present time
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Gaining the ability and skill in field interpretation and deduction. 2- Acquiring the skill of distinguishing between different geological features. 3- Dealing with the basic laws of various earth sciences. 4- Using the principle of the past is key to the present 5- Field and laboratory description 6 - investigation and exploration 7 - Scientific reports
Indicative Contents المحتويات الإرشادية	1- It includes the study of the changes that occurred on the earth's surface in terms of water distribution and land areas since its inception Earth from about 6.4 billion years ago until now. 2- Studying the Earth's relations with the solar system and the universe, as this section means by studying the effects and remnants of ancient life on Earth Earth since the emergence of life about two billion years ago to the present time 3- Providing students with an appropriate amount of information and expertise in the field of earth science in a functional manner that contributes to their acquisition of a scientific culture and contributes to academic preparation and helps them to identify the natural resources in their country.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

8. Fieldwork and Hands-on Experience. Hands-on experience allows students to develop observational skills, make connections between theoretical concepts and real-world examples, and enhance their understanding of stratigraphic principles.
9. Visual Aids: Utilize visual aids, such as diagrams, charts, maps, and photographs, to help students visualize and comprehend stratigraphic concepts. Use geological maps to demonstrate the distribution and relationships between different rock units and incorporate stratigraphic columns to illustrate the vertical succession of strata.
10. Virtual Resources: Take advantage of virtual resources, such as interactive online modules, virtual field trips, and digital simulations. These resources can provide students with immersive experiences, allowing them to explore stratigraphic principles and study geological features virtually.
11. Case Studies and Real-life Examples
12. Laboratory Work: Conduct laboratory exercises that involve the description and interpretation of rock samples, including the identification of lithology, sedimentary structures, and fossil content. Encourage students to create stratigraphic logs or cross-sections based on the laboratory data, promoting critical thinking.
13. Collaborative Learning: Foster collaborative learning environments where students can work in groups or pairs to solve problems, analyze data, or interpret stratigraphic information. This approach encourages active engagement, promotes discussions, and allows students to learn from one another's perspectives and insights.
14. Multimedia Resources: Incorporate multimedia resources, such as videos, animations, and online lectures, to supplement traditional teaching methods. Multimedia resources can help reinforce key concepts, illustrate geological processes, and provide additional visual and auditory learning opportunities.
15. Continuous Assessment and Feedback: Implement regular assessments, such as quizzes, assignments, or class discussions, to gauge student understanding and provide timely feedback. This allows students to monitor their progress, identify areas of improvement, and reinforces learning.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	146	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	9
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	225		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 8
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 9 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	8	LO # 1-7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction- Historical geology
Week 2	Relative Time and Geologic Time scale
Week 3	Geologic Laws

Week 4	Faunal succession and index fossils1
Week 5	Faunal succession and index fossils)2
Week 6	Absolute Time Parent Atom, Potassium-Argon Dating,
Week 7	Absolute Time Radiometric Dating, Uranium Dating
Week 8	Midterm Exam
Week 9	Interior of the earth
Week 10	Earth's magnetic field
Week 11	Plate tectonics
Week 12	Structural geology1
Week 13	Structural geology2
Week 14	Maps
Week 15	The history of the earth
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)	
المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1 Geologic Laws
Week 2	Lab 2: Geologic Laws
Week 3	Lab 3 difference between fossil and index fossil
Week 4	Lab 4 superposition and faunal fossil
Week 5	Lab 5 magnetic field

Week 6	Lab 6: Folding
Week 7	Lab 7: Faulting and Fracturing
Week 8	Lab 8: Topographic map, Structural map
Week 9	Lab 9 geologic map
Week 10	Lab 10: index fossil
Week 11	Lab 11: Map of isochatels and isobachs
Week 12	Lab 12: Geological section
Week 13	Lab 13: compass and field tools
Week 14	Lab 14 hydraulic properties
Week 15	Lab 15 Comprehensive laboratory review

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	1. Physical Geology First University of Saskatchewan Edition, 2. Historical geology	Yes
Recommended Texts	اساسيات الجيولوجيا التاريخية هو كتاب علمي من تأليف أ.د. محمد أحمد حسن هيكل - د. عبد الجليل عبد الحميد هويدي V002	No
Websites		

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Mineralogy		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	GEO-12005		
ECTS Credits	9		
SWL (hr/sem)	225		
Module Level	1	Semester of Delivery	2
Administering Department	Geology	College	Science
Module Leader	Hasan Kattoof Jasim	e-mail	Hasan.jasim@sc.uobaghdad.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor	Luma Jasim	e-mail	luma.riadh@sc.uobaghdad.edu.iq
Peer Reviewer Name	Prof. Dr. Aiad Ali Hussien Al-Zaidy	e-mail	aiad.hussien@sc.uobaghdad.edu.iq
Scientific Committee Approval Date	01/10/2025	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module		Semester	
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims	أهداف المادة الدراسية 3. Mineralogy aims to introduce the student to this very important science, which has many applications, as rocks are composed in nature of minerals, and

	therefore the earth's crust will also be composed of minerals, which will affect many of the events that occur in the earth's crust, as well as the economic importance of minerals, which are included in Lots of industries 4. Mineralogy also aims to recognize that minerals are the main source of chemical elements, which are considered the basic element of many sciences, especially chemistry, physics and engineering branches.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Learn about the physical properties of minerals 2- Training on the physical and chemical properties, which will help in the process of distinguishing between minerals according to their properties 3- Training in the diagnosis of minerals in the laboratory, and this will be of importance in geological work, especially in mines and field work 4- Training on the types of minerals and understanding the differences between them will have great economic importance, especially in the field of industrial minerals
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. We have introduced you to the Mineralogy. Let us now summarize what you have learned in this unit; 4- Mineralogy aims to know how and how Minerals are formed in nature 5- Mineralogy is the main branch of geology , , and this science is important, especially in mineral diagnostic processes that have many applications, especially in the classification of rocks, as well as the diagnosis of minerals of economic importance 6- Mineralogy has many important applications, especially in the identification of minerals for many purpose especially in industrial uses

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	When it comes to learning and teaching Mineralogy, it is important to employ various strategies that cater to different learning styles and maximize understanding and retention. Here are some effective learning and teaching Mineralogy:

	5- Identify the minerals are used in the laboratory and their relationship with real crystals of minerals in nature 6- Understand the ways in which minerals crystallize, which will vary according to the processes by which the types of igneous, sedimentary, and metamorphic rocks are formed. 7- The study of minerals is very important, as many industrial and engineering applications are based on it, such as construction supplies and various industries 8- Minerals are considered the backbone of the economy for many countries, as they are considered a natural wealth, just like crude oil, and minerals are found in all countries of the world because they make up the earth's crust.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	146	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	9
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	225		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 8
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 9 and 10
	Midterm Exam	2 hr	10% (10)	8	LO # 1-7

Summative assessment	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to Mineralogy
Week 2	Methods of Minerals Crystallization in the nature
Week 3	Steps of Discovering and naming a new Mineral
Week 4	Physical properties of Minerals - Optical and Cohesive Properties
Week 5	Classification of Minerals
Week 6	Form and Habits of Minerals
Week 7	Important of Minerals
Week 8	Midterm Exam
Week 9	Hazards of Minerals
Week 10	Classes and Groups of Minerals

Week 11	Non- Silicates Minerals
Week 12	Bowen Reaction Series
Week 13	Silicates Minerals
Week 14	Structure of Silicate minerals – Types of Silica Tetrahedron Connection
Week 15	Minerals in Iraq
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Introduction to Crystallography
Week 2	Lab 2: Methods for Identification of Minerals
Week 3	Lab 3: Physical properties of minerals (Optical Properties)
Week 4	Lab 4: Color of Minerals
Week 5	Lab 5: Luster of Minerals
Week 6	Lab 6: Streak of Minerals
Week 7	Lab 7: Transparency of Minerals
Week 8	Midterm Exam
Week 9	Lab 9: Physical properties of Minerals (Cohesive Properties) and Hardness of Minerals
Week 10	Lab 10: Fracture of Minerals
Week 11	Lab 11: Cleavage of minerals
Week 12	Lab 12: Other properties of identification (Electrical , Magnetic, Thermal, Test Properties)

Week 13	Lab 13: Form and Habit of Minerals
Week 14	Lab 14: Classes of Minerals
Week 15	Lab 15: Final practical Examination of Minerals

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Berry, L. G., and Meson, B., 1959, Elements of Mineralogy, W. H. Freeman and Co., USA, 550P.	Yes
Recommended Texts	Nesse, W. D., 2000, Introduction to Mineralogy, Oxford University Press, New York, 442P.	No
Websites	www.Mindat.com	

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	General Physics		Module Delivery
Module Type	BASIC		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	GEO-12006		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	1	Semester of Delivery	
Administering Department	Department of Physics	College	Science College/ University of Baghdad
Module Leader	Dr. Ali Hassan Khidhir	e-mail	ali.khidhir@sc.uobaghdad.edu.iq
Module Leader's Acad. Title	Asst. Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/10/2025	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module		Semester	
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	1. Teaching students the basic principles of physics. 2. Preparing specialists in the field of general physics and its practical applications, which bears the responsibility of studying the country's need for development and progress and capable of meeting the needs of the job market in state institutions and industry sectors. 3. Preparing an educated generation armed with science and adopts it as a sound basis to bring about radical changes and assign scientific knowledge and scientific methods in thinking, analysis and adaptation with the development of technologies, to keep up with the expansion of human needs. 4. Effective contribution for deepening and documenting the connection of the university with the society through the implementation of advisory counseling, training and development of teaching and administrative staff. 5. The service of preparing graduates specialized in physics who contribute to development in the country. 6. Meeting the needs of various sectors with highly qualified personals in the field of physics. 7. Encouraging the distinguished in this field to work as teaching assistants in the department to be part of the academic teaching staff in the future.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- enable students to obtain knowledge and understanding of the concept of physics 2- Enable students to obtain knowledge and understanding of the scientific laws of physics. 3- Enable students to keep pace with scientific development in all scientific fields of physics.
Indicative Contents المحتويات الإرشادية	This course contains a lot of vocabulary, which is a branch of physics concerned with properties of matter and energy. It includes an introduction to understanding natural affecting their course, and the formulation of knowledge into laws that do not only exp aforementioned processes also predict the course of natural processes with models gradually approach reality. The topic of general physics includes an introduction to physics, vector analysis, N linear motion, circular motion, and rotational motion. Also, gravitational force, work, angular momentum, laws of motion with constant or uniform rotational motion, dy fluids, static fluids, particle stability, electric charge, electric and electric potential i electrical circuits and ray optics. phenomena, the forces and movement acceleration

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students.
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Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ 15 اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	71	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	4.4
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	4	10% (10)	3,6 and 10,13	LO #1, #2 and #10, #11
	Assignments	4	10% (10)	2,5 and 10, 13	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #5, #9 and #10
Summative assessment	Midterm Exam	2hr	10% (10)	8	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	A brief summary of the vectors, scalar and vector quantities, addition of vectors, unit vector, component of vectors, dot product and cross product. With examples for all these topics.
Week 2	Motion on a straight line: Displacement, Average velocity, Instantaneous velocity, Average acceleration, and Instantaneous acceleration. With examples for all these topics.
Week 3	Application of Motion with a constant acceleration: Freely falling bodies, and Projectile of motion. With examples for all these topics.
Week 4	Equilibrium of a particle: Understanding of forces, Newton's first law, Newton's second law, Newton's third law, and mass and weight. With examples for all these topics.

Week 5	Friction force, inclined plane, Torque of force, Center of gravity of the body, Center of mass, Motion of a system of particle, and Newton's law of universal gravitation. With examples for all these topics.
Week 6	Circular and Rotational motion: Motion in a circle, uniform circular motion, central or radial force, non-uniform circular motion, Central or radial acceleration, Central force, tangential acceleration, and tension in circular motion. With examples for all these topics.
Week 7	Rotational motion, angular displacement, angular velocity, and angular acceleration. With examples for all these topics.
Week 8	Midterm exam
Week 9	Rotational motion with a constant angular acceleration, relation between angular and linear velocity and acceleration, torque, angular acceleration, and moment of inertia. With examples for all these topics.
Week 10	Elasticity: The stress and strain, elastic modulus, Hook's law, tensile and compressive stress and strain, Young's modulus, bulk stress and strain, bulk modulus, compressibility, shear stress and strain, Poisson's ratio, and force constant. With examples for all these topics.
Week 11	Static fluids: Density, specific gravity, pressure in a fluid, atmospheric pressure, pressure-depth Pascal's law, buoyancy, Archimedes principle, and define the surface tension. With examples for all these topics.
Week 12	Dynamic fluids: Ideal fluid, the continuity equation, Bernoulli's equation, Venturi meter, and define the viscosity. With examples for all these topics.
Week 13	Electric charge and electric field: Conductor, insulator, and induced charges. Coulomb's law, electric field, intensity of electric field, electric potential energy, electric potential energy in a uniform field, electric potential energy of two point charges, potential difference, potential gradient, equipotential surfaces, and electric potential. With examples for all these topics.
Week 14	Geometric optics: Nature and propagation of light, wave front, properties of light, types of reflection, index of refraction, laws of reflection and refraction, total internal reflection, real and apparent depth, refraction by prism.
Week 15	mirrors & lenses: Spherical mirrors, image formations, spherical aberration, types of simple lenses, converging lens, diverging lens, properties of lenses, image formation by thin lenses,
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
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Week 1	Moment of inertia for flywheel
Week 2	Simple pendulum
Week 3	Surface tension
Week 4	Speed of sound
Week 5	Glass refractive index
Week 6	diffraction grating
Week7	Equilibrium forces

Week 8	Mid. term exam.
Week 9	Ohm's law
Week 10	Viscosity
Week 11	Wheatstone bridge
Week 12	inclined plane
Week 13	Archimedes principle
Week 14	focal length of the lens
Week 15	standing waves
Week 16	Final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Fundamental of Physics (Halliday, Resnick, and Walker).	Yes
Recommended Texts		
Websites		

Grading Scheme مخطط

الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 - 49)	FX - Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F - Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM

وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Mathematics		Module Delivery	
Module Type	B		☒ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	GEO-12007			
ECTS Credits	4			
SWL (hr./sem)	100			
Module Level	1	Semester of Delivery		2
Administering Department	Mathematics	College	Science	
Module Leader	Dina Sultan		e-mail	dina.s@sc.uobaghdad.edu.iq
Module Leader's Acad. Title	Assist. Prof	Module Leader's Qualification	MSc	
Module Tutor			e-mail	
Peer Reviewer Name	Prof. Dr. Hamid Hassan Abdullah	e-mail	Hamid.h@sc.uobaghdad.edu.iq	
Scientific Committee Approval Date	01/10/2025	Version Number	1.0	

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	—
Co-requisites module	None	Semester	—

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. To provide students with a solid foundation in Calculus at degree level and equip them with a knowledge of the necessary methods and techniques in applied mathematics for further study. 2. It deals with the basic concept of functions limit, continuity, derivation and their consequences. 3. To develop problem solving skills and understanding of differentiation rules through the application.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Students will become familiar with functions and limits. They will gain an understanding of convergence of sequences and series, and understanding of the foundations of differentiation and integration. 2. Students will be able to compute limits of sequences and series, find derivatives, integrate elementary functions. 3. Students will have enhanced skills in the following areas: modelling, spatial awareness, abstract reasoning and numeracy.
Indicative Contents المحتويات الإرشادية	The course will supply the students with basic concepts of differentiation (chain, product, quotient). Derivatives of standard functions (powers, polynomials, trigonometric). The exponential function: and logarithm as inverse. Derivatives of inverse functions via chain rule, local extrema and curve sketching.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	2
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Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	67	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.47
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	20% (20)	5, 10	1, 3 and 13
	Assignments	2	20% (20)	2, 12	2, 6 and 10
	Projects / Lab.	0	0	—	—
	Report	0	0	—	—
Summative assessment	Midterm Exam	2 hr.	10% (10)	8	1-7
	Final Exam	3 hr.	50% (50)	17	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Basic concepts: sets, lines, circles and functions.
Week 2	Domain, range and inverse of functions.
Week 3	Derivative: motivation, informal definition of limit
Week 4	Limits properties
Week 5	Continuity
Week 6	Trigonometric functions, their target and continuity
Week 7	Derivative rules of elementary functions
Week 8	Mid-term Exam + Discussion

Week 9	Derivatives of trigonometric and inverse trigonometric functions
Week 10	Applications of derivative; maximum and minimum
Week 11	Mean value theorem with applications
Week 12	Roll's theorem with applications
Week 13	Introduction to L'Hospital's rule
Week 14	Graph sketching
Week 15	Review
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

None

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Thomas Calculus, Joel R. Hass, Maurice D. Weir, 15th edition (2022).	Yes
Recommended Texts	Differential calculus and their applications, M. Barun, 3 rd edition, Applied mathematical sciences.	No
Websites	https://www.sciencebooksonline.info/mathematics.html	

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
Success Group	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors

(50 - 100)	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Arabic Language 1		Module Delivery
Module Type	B		☒ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	UOB-101		
ECTS Credits	2		
SWL (hr/sem)	50		
Module Level	1	Semester of Delivery	
Administering Department	Geology	College	Science
Module Leader	Dr. Leqaa faleh owdaa	e-mail	leqaa.falih@ircoedu.uobaghdad.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Kamal Kareem Ali	e-mail	kamal.ali@sc.uobaghdad.edu.iq
Scientific Committee Approval Date	01/10/2025	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1-تعلم مهارات الكتابة والاملاء والتعبير الصحيح خلال تطبيق قواعد اللغة العربية بشكل مفصل وتطبيقي على نصوص عربية. 2- لفهم الجمع وأنواع الاسماء وكيفية التعامل معها. 3- لفهم العدد واستعماله بشكل صحيح من حيث المطابقة والمخالفة للتفريق بين الضاد والطاء. 4- للتفريق ومعرفة استعمال التاء المربوطة والتاء الطويلة. 5- التمييز بين العلامات الاصلية والفرعية. 6- تعلم استعمال الأدوات وعمل كل أداة ومعناها في التعبير.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	هام: 6 مخرجات تعليمية على الأقل، ومن الأفضل أن تكون مساوية لعدد أسابيع الدراسة 1- التعرف على كيفية جمع الأسماء وأنواع الجموع وسبب اختلافها وقائمة بالمصطلحات المختلفة المرتبطة ببلاغة اللغة العربية تعلم كتابة الهمزة وانواعها. 2- وصف عمل الجمل الفعلية وأنواع الافعال 3-ناقش وتفاعل ومشاركة قواعد الجمل الاسمية وعلامات الاعراب الاصلية والفرعية والتطبيقات ضمن نصوص أدبية وقرائية. 4- القدرة على استعمال علامات الترقيم في كتابة البحوث والتقارير . 5- التمييز بين الأدوات وأسلوب العطف والجر. 6- التعرف على قواعد اللغة العربية الأساسية وتطبيقاتها.
Indicative Contents المحتويات الإرشادية	يتضمن المحتوى الإرشادي ما يلي. مقدمة في البداية التي أسس لها علماء اللغة العربية وكيف بدأت كتابة المؤلفات بالمعاجم والقواعد وجمع اللهجات واستقراء اللغة وحركة الترجمة والفتوحات وتطور اللغة. ومشكلات المراجعة (6 ساعات) ودراسة الجمل وانواعها والافعال والعلامات الاصلية والفرعية والعدد. ومشكلات الكتابة والاملاء التي يقع فيها الطلبة في التفرقة بين الضاد والطاء والتاء المربوطة والطويلة والهمزة وانواعها وكيفية كتابتها (6ساعات) ودراسة الموضوعات الصرفية التي تخص المشتقات من اسم الفاعل واسم المفعول وصيغة المبالغة واوزانها ومعانيها وصيغها السماعية والقياسية.. وعلامات الترقيم وكيفية توظيفها في كتابة التقارير والبحوث والمخطوطات. (6ساعات)
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	كتب شيئاً مثل: الاستراتيجية الرئيسية التي سيتم تبنيها في تقديم هذه الوحدة هي تشجيع الطلاب على المشاركة في التمارين، مع تحسين مهارات التفكير النقدي وتوسيعها في نفس الوقت. سيتم تحقيق ذلك من خلال الفصول والبرامج التعليمية التفاعلية ومن خلال النظر في أنواع التجارب البسيطة التي تتضمن بعض أنشطة أخذ العينات التي تهتم الطلاب.

Student Workload (SWL) الحمل الدراسي للطلاب محسوب لـ 15 اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	33	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	2

Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	17	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	1
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	50		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	6	10% (10)	2,3,6,8,10 and 12	LO #3, #4 and #6, #7
	Projects / Lab.		10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	Midterm Exam	2hr:	10% (10)	8	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	علامات الترقيم والتنقيط والنواسخ
Week 2	المشتقات
Week 3	الجملة الاسمية
Week 4	الجملة الفعلية
Week 5	الفرق بين الضاد والظاء
Week 6	التاء المربوطة والتاء المفتوحة
Week 7	الهمزة وانواعها
Week 8	Mid Exam

Week 9	الجمع العدد
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Week 10	العلامات الاصلية والعلامات الفرعية
Week 11	اعلام عراقيون بدر شاكر السياب والجواهري
Week 12	العطف
Week 13	حروف الجر
Week 14	الاسم المؤنث والاسم المذكر
Week 15	الحذف والزيادة
Week 16	الأسماء المنصوبة

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	جامع الدروس العربية وشرح ابن عقيل	Yes
Recommended Texts	Electromagnetic theory (book). 2000.vol.1	yes
Websites	https://www.coursera.org/browse/physical-science-and-engineering/electricalengineering	

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 - 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.



Ministry of Higher Education and
Scientific Research - Iraq
University of Baghdad
College of Sciences
Department of Geology



جامعة بغداد / كلية العلوم

قسم علم الارض

مواد المرحلة الثانية

الفصل الدراسي الاول

و

الفصل الدراسي الثاني

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Invertebrate Fossils I		Module Delivery
Module Type	Core		☒ Theory
Module Code	GEO-23008		☐ Lecture
ECTS Credits	6		☒ Lab
SWL (hr/sem)	150		☐ Tutorial
			☐ Practical
			☐ Seminar
Module Level	2	Semester of Delivery	3
Administering Department	Geology	College	Science
Module Leader	AfraH H. Saleh AL-Ekabi	e-mail	afrah.hsaleh@sc.uobaghdad.edu.iq
Module Leader's Acad. Title	Assistant Professor	Module Leader's Qualification	Ph.D.
Module Tutor	d.Anwar Khadem &Assi. Luay Sameer	e-mail	mailto:anwar.mousa@sc.uobaghdad.edu.iq mailto:Luay.shakir@sc.uobaghdad.edu.iq
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/09/2025	Version Number	1.0

Relation with other Modules	
العلاقة مع المواد الدراسية الاخرى	
Prerequisite module	None
Co-requisites module	GEO-2414
Module Aims, Learning Outcomes and Indicative Contents	
اهداف المادة الدراسية ونتائج التعلم والمحتويات الارشادية	
Module Aims اهداف المادة الدراسية	1. This module on individual projects and provides the students more information about the main phylum of animals. 2. Training the student to understand the shapes, modes of preservation, classification, nomenclature of species and genera.

Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. beneficialness the specifying geological time then educing the paleo environment. 2. Acquiring the skill of distinguishing between different geological formations. 3. Dealing with the basic laws of various earth sciences. 4. Using the principle of the past as a key to the present in reconstructing the geological history of the earth's formation and development.
Indicative Contents المحتويات الارشادية	1. Invertebrate Fossils is a branch of Geology which deals with an animal without a backbone. In fact, invertebrates don't have any any bones at all! Invertebrates that you may be familiar with include spiders, worms, snails, lobsters, crabs and insects like butterflies. However, humans and other animals with backbones are vertebrates. It focuses primarily on stratified phylum of animals that includes types of marine organisms & Mode of life [15 hrs] 2. The principles on which the Invertebrate Fossils studies are based include order variety phylum of animals, [15 hrs]. 3. an organism must be an animal to be classified as an invertebrate, meaning they are members of the kingdom Animalia. [15 hrs]. 4. the species in question must lack a notochord during embryonic development and a backbone, also called a spine, and a spinal cord. 5. The majority of living animals are invertebrates. Invertebrates lack a backbone. [15 hrs]. 6. Invertebrates may have an incomplete or a complete digestive system. 7. Invertebrates vary in how they move and in the complexity of their nervous system. And Most invertebrates reproduce sexually. [15 hrs]. 8. They bring beauty into our lives, ensure we have food on our plates, and are at the heart of a healthy environment. The services they perform—pollinating, dispersing seeds, becoming food for wildlife, recycling nutrients, cleaning water, building reefs—are critical to life on our planet.
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Hands-on Experience: Hands-on experience allows students to develop observational skills, make connections between theoretical concepts and real-world examples, and enhance their understanding of stratigraphic principles. 2. Visual Aids: Utilize visual aids, such as diagrams, charts, maps, and photographs, to help students visualize and comprehend stratigraphic concepts. 3. Virtual Resources: Take advantage of virtual resources, such as interactive online modules. These resources can provide students with immersive experiences, allowing them to explore stratigraphic principles and study geological features virtually. 4. Case Studies and Real-life Examples: Present case studies and real-life examples that illustrate the application of stratigraphic principles in various contexts, such as paleoenvironmental reconstructions, or geological hazard assessments. These examples can help students understand the practical significance of the course. 5. Laboratory Work: Conduct laboratory exercises that involve the description and interpretation of samples. Encourage students to the laboratory data. 6. Collaborative Learning: Foster collaborative learning environments where students can work in groups or pairs to solve problems, analyze data. This approach encourages active engagement, promotes discussions, and allows students to learn from one another's perspectives and insights. 7. Multimedia Resources: Incorporate multimedia resources, such as videos, animations, and online lectures, to supplement traditional teaching methods. Multimedia resources can help reinforce key concepts.

	8. Allows students to monitor their progress, identify areas of improvement, and reinforces learning. 9. Integration of Technology: Utilize geospatial software, stratigraphic modeling tools, and other technology-based resources to enhance the learning experience.
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Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	Material Covered
Week 1	Introduction of Paleontology
Week 2	Modes of Preservation
Week 3	Rules of species nomenclature & Time Geological Scale
Week 4	Habit (Mode of life) of marine organisms
Week 5	Taphonomy & Preservation
Week 6	Forms of preservation
Week 7	Foraminifera
Week 8	Foraminiferal Test, Wall & Aperture
Week 9	Radiolaria
Week 10	Classification of Radiolaria
Week 11	Phylum of Porifera (Sponge)
Week 12	Classification of Porifera (Sponge)
Week 13	Phylum Coelentrata (Cnidaria)
Week 14	Classification of Coelentrata (Cnidaria)
Week 15	Phylum Bryozoa
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر

Week	Material Covered
Week 1	Lab1 : Introduction of Paleontology
Week 2	Lab2 : Modes of Preservation
Week 3	Lab3 : Rules of species nomenclature & Time Geological Scale
Week 4	Lab4 : Habit (Mode of life) of marine organisms
Week 5	Lab5 : Taphonomy & Preservation
Week 6	Lab6 : Forms of preservation
Week 7	Lab7 : Foraminifera
Week 8	Lab8 : Foraminiferal Test, Wall & Aperture
Week 9	Lab9 : Radiolaria
Week 10	Lab10 : Classification of Radiolaria
Week 11	Lab11 : Phylum of Porifera (Sponge)
Week 12	Lab12 : Classification of Porifera (Sponge)
Week 13	Lab13 : Phylum Coelentrata (Cnidaria)
Week 14	Lab14 : Classification of Coelentrata (Cnidaria)
Week 15	Lab15 : Phylum Bryozoa
Week 16	Lab16 : Preparatory week before the final Exam

Student Workload (SWL)			
الحمل الدراسي للطلاب محسوب لـ 15 أسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	71	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	4.47
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	150		

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	20% (20)	5, 10	1, 3 and 13
	Assignments	2	20% (20)	2, 12	2, 6 and 10
	Projects / Lab.	0	0	—	—
	Report	0	0	—	—
Summative assessment	Midterm Exam	2 hr.	10% (10)	8	1-7
	Final Exam	3 hr.	50% (50)	17	All
Total assessment			100% (100 Marks)		

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	This module on individual projects and provides the students more information about the main phylum of animals to understand the shapes, modes of preservation, classification, nomenclatures to beneficialness the specifying geological time then educating the paleo environment.	Yes
Recommended Texts	To development this module through saving the high – technology such as more references modernist then development experiments laboratory finally making- clear tactics to valeting the students.	Yes
Websites		

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Optical Mineralogy		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	GEO-23009		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	2	Semester of Delivery	3
Administering Department	Geology	College	Science
Module Leader	Hasan Kattoof Jasim	e-mail	Hasan.jasim@sc.uobaghdad.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor	Dr. Safaa Deeb	e-mail	safaa.a@sc.uobaghdad.edu.iq
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/09/2025	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module		Semester	
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims	Optical Mineralogy aims to introduce the student to this very important science, which has many applications especial the identification the mineral through the polarizing

أهداف المادة الدراسية	microscopre, as rocks are composed in nature of minerals, and therefore the earth's crust will also be composed of minerals, which will affect many of the events that occur in the earth's crust, as well as the economic importance of minerals, which are included in Lots of industries. Optical Mineralogy is important not only in the study of minerals, but it has many practical applications in the field of medicine, engineering, agriculture and forensics Optical Mineralogy also aims to recognize that minerals are the main source of chemical elements, which are considered the basic element of many sciences, especially chemistry, physics and engineering branches.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Learn about the identification of minerals under the polarizing microscope Training on making thin section of minerals and rock types in geological workshops and how to manufacture them Training on how to use a polarizing microscope, learn about all its parts, how to maintain it and replace its parts Training on the skills of dealing with rock and mineral samples and how to determine the appropriate section for making slides
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. We have introduced you to the Mineralogy. Let us now summarize what you have learned in this unit; Optical Mineralogy aims to know the identification of minerals through the polarizing microscope by using thin section of minerals and rocks and friable sediments Optical Mineralogy is the main branch of geology , , and this science is important, especially in mineral diagnostic processes that have many applications, especially in the classification of rocks, as well as the diagnosis of minerals of economic importance Optical Mineralogy is not only concerned with the identification of minerals and rocks, but it is possible to study many applications through a polarizing microscope, such as dental slides, seeds, and the components of dust storms

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	When it comes to learning and teaching Mineralogy, it is important to employ various strategies that cater to different learning styles and maximize understanding and retention. Here are some effective learning and teaching Mineralogy: Mastering work skills in geological workshops and learning about the types of devices available in them and how to operate them Training and mastering the process of making thin slices of minerals and rocks and getting acquainted with the most important materials needed to manufacture thin slices of minerals and rocks and mastering the manufacturing steps Mastering the process of diagnosing minerals through the optical properties of minerals and the relationship of polarized light to minerals when light penetrates a mineral slice

	Understanding and comprehending the basic characteristics of each mineral and what is the basic characteristic of the diagnosis through which the move is made to determine the mineral composition of the three types of igneous, sedimentary and metamorphic rocks
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Student Workload (SWL)			
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	71	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation					
تقييم المادة الدراسية					
As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 8
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	8	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
Week	Material Covered

Week 1	Introduction to Optical Mineralogy
Week 2	The Nature and properties of Light, retardation , vibration , wave length
Week 3	Concept and Methods of Polarization
Week 4	Types of polarized Light
Week 5	Refraction of Light and Snels Low
Week 6	Types of polarizes microscopes
Week 7	Optical Poetries
Week 8	Mid Theoretical Examination
Week 9	Plane Polarized Light Properties Color and peleochoism
Week 10	Relief, Cleavage and Refractive Index
Week 11	Form and Habit of Minerals
Week 12	Cross Nichols Polarized light Properties , Quartz Wedges
Week 13	Extinction, Twining, Interference Colors, Accessories Plates
Week 14	Sign of Elongation and Interference Figures and Optic Sign , Optical Indicatrix
Week 15	Rock Forming minerals Groups with their main optical properties
Week 16	Final Theoretical Examination

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

Week	Material Covered
Week 1	Lab 1: Introduction and applications of Optical Properties
Week 2	Lab 2: Sample preparation for thin section preparation , Parts of Microscopes
Week 3	Lab 3: Types of Samples and Epoxy
Week 4	Lab 4: Plane polarized Light Properties
Week 5	Lab 5: Color and Paleochroism

Week 6	Lab 6: Cleavage
Week 7	Lab 7: Relief and refractive Index
Week 8	Lab 8: Form and Habit of Minerals
Week 9	Lab 9: Cross Nichols polarized light properties
Week 10	Lab 10: Twinning and Extinction
Week 11	Lab11: Interference colors and color order
Week 12	Lab 12: Interference Figures and Optic Sign
Week 13	Lab 13: Sign of Elongation
Week 14	Lab 14: Optical properties of common rock forming minerals
Week 15	Lab 15: Final Practical Examination of Optical Mineralogy

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Kerr, P.F., 1959 , Optical mineralogy, McGraw-Hill., New York. 442P.	Yes
Recommended Texts	Nesse, W. D., 2000 , Introduction to Mineralogy, Oxford University Press, New York, 442P.	No
Websites	https://www.coursehero.com/file/9370916/uniaxial-minerals/	

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Structural Geology I		Module Delivery	
Module Type	C		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	GEO-23010			
ECTS Credits	6			
SWL (hr/sem)	150			
Module Level	2	Semester of Delivery		3
Administering Department	Geology	College	College of Science	
Module Leader	Dr. Atheer Idan Khalil		e-mail	atheer.khalil@sc.uobaghdad.edu.iq
Module Leader's Acad. Title	Assist. Professor		Module Leader's Qualification	PhD
Module Tutor	Dr. Manal Shakir Ali Dr. Janan Mansour Goraël		e-mail	manal.ali@sc.uobaghdad.edu.iq Janan.goraël@scbaghdad.edu.iq
Peer Reviewer Name	Aiad Ali Hussein		e-mail	aiad.hussien@sc.uobaghdad.edu.iq
Scientific Committee Approval Date	01/09/2025		Version Number	1.0

Relation with other Modules				
العلاقة مع المواد الدراسية الأخرى				
Prerequisite module	None		Semester	
Co-requisites module	None		Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	The primary goal of structural geology is to use measurements of present-day rock geometries to uncover information about the history of deformation (strain) in the rocks, and ultimately, to understand the stress field that resulted in the observed strain and geometries. Also to understand the structural evolution of a particular area due to plate tectonics. Understanding of the structure (geometry) of the underlying rocks is vitally important in the mining and petroleum industries. Recognize, classify, measure, record and analyze geological structures at a variety of scales and represent them in field note books and upon geological maps, sections and stereograms.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	• Understand and describe the features formed in rocks when subject to stress, analyze the strain in these rocks and interpret the Paleostress field that affected the rock and caused the deformation • know the brittle, ductile and plastic deformation • understand deformation mechanisms at micro- and macro-scales • describe the geometry and properties of different deformation structures • run structural fieldwork and use structural field data in geometrical and kinematic analyses • Visualize and interpret structural observations and measurements.
Indicative Contents المحتويات الإرشادية	• An understanding of stress and its origins within the lithosphere. • An understanding of strain as it relates to naturally occurring deformation. • To observe deformed rocks and find an explanation for how and why they ended up in their present state. • To understand under which physical condition the rock was formed and how the structures were made. Small models are being demonstrated how stress, strain, temperature, and pressure worked.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	• Inquiry-based learning, where students explore a question or problem through observation, experimentation, or data analysis. • Peer instruction, where students answer questions and explain their reasoning. • Cooperative learning, which has students work in small groups to complete a task. • During class time, interactive activities, discussions are used.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	71	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	4, 10	
	Assignments	2	10% (10)	2, 12	
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	7	
Summative assessment	Midterm Exam	2hr	10% (10)	8	
	Final Exam	3hr	50% (50)	15	All

Total assessment	100% (100 Marks)		
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Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Force (F)
Week 2	Composition and resolution of forces
Week 3	Differential forces
Week 4	Stress
Week 5	The principal stress in native
Week 6	Deformation and strain
Week 7	Isotropic materials and an isotropic material
Week 8	Midterm Exam
Week 9	Three stages of deformation
Week 10	Brittle and ductile deformation
Week 11	Young's modulus (modulus of elasticity) E
Week 12	Factors controlling behavior of materials
Week 13	Homogeneous and heterogeneous deformation
Week 14	Pure shear and simple shear
Week 15	Preparatory Week

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Introduction to Topographic Maps

Week 2	Lab 2: How to draw a contour map from points of known elevation.
Week 3	Lab 3: Geological maps for Horizontal Beds
Week 4	Lab 4: Geological maps for Inclined Beds
Week 5	Lab 5: Geological maps and cross sections
Week 6	Lab 6: Geological maps for Unconformity surfaces
Week 7	Lab 7: Geological maps for Anticline Structure
Week 8	Midterm Exam
Week 9	Lab 8: Geological maps for Syncline Structure
Week 10	Lab 9: Geological maps for plunging Anticline
Week 11	Lab 10: Geological maps for plunging Syncline
Week 12	Lab 11: Geological maps for double plunging structures
Week 13	Lab 12: Geological maps for vertical fault
Week 14	Lab 13: Geological maps for inclined fault
Week 15	Preparatory Week

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Structural Geology Third Edition - Marland P. Billings, 1972 Structural Geology by Haakon Fossen, 2010	No
Recommended Texts	Earth Structure: An Introduction to Structural Geology and Tectonics Second Edition by Ben A. van der Pluijm and Stephen Marshak, 2004	No
Websites		

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
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Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

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MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				معلومات المادة الدراسية
Module Title	Geomorphology		Module Delivery	
Module Type	Core		☒ Theory ☒ Lecture ☒ Lab ☒ Tutorial ☒ Practical ☒ Seminar	
Module Code	GEO-23011			
ECTS Credits	5			
SWL (hr/sem)	125			
Module Level	2	Semester of Delivery	3	
Administering Department	Geology	College	Science	
Module Leader	Dr. Muaid Jaseem Rasheed	e-mail	muayid.j@sc.uobaghdad.edu.iq	
Module Leader's Acad. Title	Assistant professor	Module Leader's Qualification	Ph.D.	
Module Tutor	Dr. Zainab Damad Hassan	e-mail	zainab.hassan@sc.uobaghdad.edu.iq	
Peer Reviewer Name	Name	e-mail	E-mail	
Scientific Committee Approval Date	01/09/2025	Version Number	1.0	

Relation with other Modules		العلاقة مع المواد الدراسية الاخرى
Prerequisite module	None	
Co-requisites module	GEO-2417	
Module Aims, Learning Outcomes and Indicative Contents		
اهداف المادة الدراسية ونتائج التعلم والمحتويات الارشادية		
Module Aims اهداف المادة الدراسية	1. This course aims to familiarize students with geomorphology and teach students how to describe and name landforms. The reason for their occurrence and then the explanation of these geomorphological phenomena. 2. Learn the basic principles of geomorphology. 3. Study the phenomena of weathering and erosion, their types, and their geomorphological effects on the formation of soils and sediments, their types, and change. Geomorphological forms. Study of the phenomenon of desertification and geomorphology of deserts. 4. Study of rivers, river patterns, and valley development.	

Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Knowledge and understanding: Upon completion of the course, the student will be able to absorb the following knowledge and understanding skills. • A1- Basic knowledge in the principles of geomorphology • A2- Identify the basic concepts and perceptions of the branches of geomorphology. • A3- Knowledge of the practical aspects of some basic concepts and their field applications. • A4- Acquire the ability to link the theoretical aspect of the branches of geomorphology with their various applications in geomorphological fields and different landforms • A5- Understand the relationship of geomorphology and its connection to other branches of science.
Indicative Contents المحتويات الارشادية	• The student's liking for the subject - • Simplify the material with drawing • Notifying the student of the importance of the subject in his current and future studies. • Cultivating the spirit of scientific competition among students and rewarding them for it
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	• Introductory lectures to give students a comprehensive overview of the subject matter • Covering the theoretical aspect by giving lectures or using modern technologies in presenting academic courses • Using microscopes and stereoscopes as means of teaching and clarification • Assigning students to solve assignments on specific topics and then discussing them during the lesson to demonstrate the extent of their familiarity with the acquired knowledge and so that they become capable of scientific research. • Assigning students to visit the library and websites to obtain academic knowledge of various geological sciences

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction
Week 2	Concepts of geomorphology
Week 3	Concepts of geomorphology
Week 4	An Analysis of the Geomorphic processes
Week 5	Geomorphological processes and the impact of climate on them
Week 6	Weathering and its kinds and its Significance
Week 7	Soils , kinds ,profile .

Week 8	River cycle
Week 9	EXAM.1
Week 10	Shapes resulting from river meanders

Week 11	Landslide
Week 12	Drainage Patterns and their Significance
Week 13	River terraces
Week 14	Deserts
Week 15	Sand dunes
Week 16	EXAM.2

Delivery Plan (Weekly Lab. Syllabus)	
المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Introductions
Week 2	Lab 2: Scales
Week 3	Lab 3: Longitude& Latitude
Week 4	Lab 4: Longitude& Latitude an exercise
Week 5	Lab 5: Stream order& stream density
Week 6	Lab 6: EX ₁
Week 7	Lab 7: Generalized
Week 8	Lab 8: Slope map
Week 9	Lab 9: Contour Map an exercise 3
Week 10	Lab 10: Map with v.
Week 11	Lab 11: EX ₂
Week 12	Lab 12: v" rule"1
Week 13	Lab 13: v" rule"2

Week 14	Lab 14: Final EX ₃
Week 15	Lab 15: Application

Student Workload (SWL)			
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	46	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	4, 10	
	Assignments	2	10% (10)	2, 12	
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	7	
Summative assessment	Midterm Exam	2hr	10% (10)	8	
	Final Exam	3hr	50% (50)	15	All
Total assessment			100% (100 Marks)		

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Fundamental of Geomorphology	Yes

Recommended Texts	According to the geomorphology titles in the course.	Yes
Websites	Accessing scientifically websites from Wikipedia or universities (lectures and videos).	

Grading Scheme				
مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
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	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
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Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Baath Regime Crimes in Iraq جرائم حزب البعث البائد		Module Delivery	
Module Type	Basic		☒ Theory Lecture Lab Tutorial Practical Seminar	
Module Code	UOB-105			
ECTS Credits	2			
SWL (hr/sem)	50			
Module Level	2	Semester of Delivery		3
Administering Department	Geology	College	Science	
Module Leader	Ansam Faik Abdul - Rezzak Al-Obidi		e-mail	ansam.faik@sc.uobaghdad.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	MSc	
Module Tutor	Name (if available)		e-mail	E-mail
Peer Reviewer Name	Name Dr farah diea hussain mubarak		e-mail	Farah@copolicy.uobaghdad
Scientific Committee Approval Date	01/09/2025	Version Number	1.0	

Relation with other Modules	
العلاقة مع المواد الدراسية الأخرى	
Prerequisite module	None
Co-requisites module	None

Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. ان الاجيال الحالية لم تعيش فترة الدكتاتورية والكثير منهم البعير معاناة الشعب والجرائم التي ارتكبتها النظام المقيور 2. بيان مدى سوء حكم النظام الشمولي والذي لم يقتصر فقط على داخل العراق بل على دول المجاور له 3. توعية الطلبة على الاضرار الكبيرة التي أحدثها النظام البائد والجرائم التي ارتكبتها بحق الشعب العراقي 4. أظهار الاضرار الاقتصادية والاجتماعية والتنموية التي أحدثها النظام السابق 5. بيان مدى وحشية النظام البائد والإعدامات الجماعية 6. بيان الساليب القمعية التي مارسها النظام البائد والتهجير القسري 7. كبح الحريات العامة وتدهور مستوى الاعلام والثقافة 8. توضيح الاضرار البيئية والزراعية التي ظهرت آثارها في السنوات السابقة والحالية 9. بيان مدى سوء حكم النظام الشمولي والذي لم يقتصر فقط على داخل العراق بل على دول المجاورة ايضا 10. ان الهدف من تدريس هذه المادة لمعرفة تاريخ تلك الحقبة السوداء 11. الهدف من هذه المادة ان الحكم في العراق لن يدوم باستخدام أدوات العنف والقوة مهما كانت مفرطة 12. والعراق يجب ان يحكم بنظام سياسي يحترم العراقيين ومعتقدات ودياناتهم وقومياتهم وان يؤمن بالتعدد في المجتمع العراقي
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. التعرف على الجرائم النظام البائد في كبح الحريات العامة 2. دراسة الانظمة السياسية في العراق نبذة تاريخية 3. معرفة ابرز انتهاكات النظام البعثي للحقوق والحريات 4. معرفة اثر سلوكيات النظام البعثي المقيور على المجتمع العراقي 5. التوضيح للاجيال الحالية حقيقة حقبة تاريخية سوداء في تاريخ العراق المعاصر التي شهدت الظلم والاستبداد 6. الاطلاع على وحشية واستبداد وقمع النظام البائد للشعب العراقي 7. تعليم الطلبة وارشادهم على النظام السياسي الصحيح لحكم هذا الشعب الطيب. والذي يجب ان يبتعد عن الدكتاتورية والظلم وان يكون مبني على العدالة واحترام التعددية الدينية والمذهبية والقومية 8. توعية الطلبة الى حجم الدمار والتلوث البيئي الذي أحدثته الحروب واستخدام اسلحة محرمة دوليا 9. توعية الطلبة الى حجم الدمار والتلوث البيئي الذي أحدثته الحروب واستخدام اسلحة محرمة دوليا 10. بيان مدى قسوة النظام البعثي وقمعه للشعب والمقابر الجماعية التي ضمت رفاة آلاف الشهداء الأبرياء 11. توعية الطلبة الى مقام به النظام السابق من تهجير ابناء هذا البلد وكفاته العلمية والادبية
Indicative Contents المحتويات الإرشادية	تضمن المحتوى الإرشادي مقدمة في البداية تشتمل على نبذة تاريخية عن النظام السياسي في العراق، وصولاً إلى وصول حزب البعث المقيور إلى السلطة. وكذلك دراسة جرائم حزب البعث منذ توليه السلطة والعبث بها، بالإضافة إلى توضيح ما أصاب العراق من آثار وكوارث على يد هذا النظام الديكتاتوري المجرم الذي جسّد أقصى أنواع التعسف والظلم والطغيان والاستبداد كما يهدف إلى إرشاد الطلبة إلى أن الظلم والاستبداد يدمران الشعوب ويجزّان الولايات عليها، وبيان الآثار التي حدثت نتيجة الحروب العنيفة والتي خلفت وراءها تدميراً في كل مفاصل البلاد؛ فدمرت البنية التحتية والتي كانت تُعد من أفضل البنى التحتية في بلدان الشرق الأوسط كذلك تم تدمير البيئة؛ من خلال تفجير الآبار النفطية في حرب الكويت والخصائر الاقتصادية الهائلة، وتخريب البيئة المائية من خلال تسريب النفط في المياه، فضلاً عن تلوث الهواء والأشجار وكل شيء حي. وال زلنا إلى يومنا هذا نعاني من آثار تدمير البنية التحتية والصناعة، وفرض حصارٍ دمر البيئة الاجتماعية والاقتصادية للبلاد، نتيجة سياسات النظام البائد على الصعيدين الدولي والداخلي."

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	الاستراتيجية المهمة التي تم تبنيها في هذه الوحدة هي توعية الطلبة وعملية تنمية مداركهم العقلية على فهم النظام السياسي العراقي البائد ومعرفة الجرائم التي ارتكبها النظام البائد وعملية تحفيز الطلبة على التأمل والتفكير في التحليل هذه الجرائم وانعكاساتها والعمل على محاربة الظلم والاستبداد ورفض اي شكل من اشكال الدكتاتورية كذلك استخدام البرامج التفاعلية والتعليمية في استخدام الأدوات التحليلية والنقدية وتشجيع الطلبة على البحث والحوار والنقاش على اساس معرفية تستند الى عمليات البحث العلمي والتدقيق والقراءة العميقة والفهم الجيد والرصانة العلمية وكذلك استخدام الوسائل العلمية والاساليب التفاعلية سواء كانت المجموعة والمرئية واعطاء الأدلة المادية الواضحة على وحشية النظام السابق لكي يطلع الطلبة وتصبح لديهم ثقافة علمية راسخة على هذه الحقبة السوداء والجرائم التي لم تشهد لها البشرية مثل كذلك تنمية القدرة الذهنية والفكرية لدى الطلبة على معرفة الأنظمة الصالحة كذلك تفعيل الدور الأخلاقي وزرع الأخلاق والقيم والمبادئ الحميدة لدى الطلبة
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Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	33	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	1
Unstructured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	17	Unstructured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	0.5
Total SWL (h/sem) الحمل الدراسي للطلاب خلال الفصل	50		

Module Evaluation

تقييم المادة الدراسية

	Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Quizzes	2	10% (10)	5 and 10	LO #1, #2 and #10, #11

Formative assessment	Assignments	8	10% (10)	2,3,6,8,10 and 12	LO #3, #4 and #6, #7
	Projects / Lab.		10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	Midterm Exam	1hr:	10% (10)	8	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المناهج الاسبوعي النظري	
	Material Covered
Week 1	مقدمة عن انتهاكات الحقوق والحريات
Week 2	نبذة وصفية عن الانظمة السياسية في العراق
Week 3	انتهاكات النظام البعثي للحقوق والحريات العامة
Week 4	اثر سلوكيات النظام البعثي في المجتمع وتسلمه على الدولة
Week 5	اثر المرحلة الانتقالية في محاربة السياسة الاستبدادية
Week 6	الميدان النفسي والاجتماعي
Week 7	الدين والدولة
Week 8	Mid Exam
Week 9	عسكرة المجتمع والثقافة والاعلام
Week 10	اثر القمع والحروب على البيئة والسكان
Week 11	تلوث البيئي واستعمال الاسلحة المحرمة دوليا
Week 12	سياسة الارض المحروقة وتجفيف الاهوار
Week 13	المقبر الجماعية وتدمير البيئة الزراعية
Week 14	Mid Exam

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	مناهج جرائم حزب البعث البائد 2023/جمهورية العراق/وزارة التعليم العالي والبحث العلمي/دائرة الدراسات والتخطيط	
Recommended Texts		
Websites		

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	English Language II		Module Delivery
Module Type	B		☒ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	UOB-202		
ECTS Credits	2		
SWL (hr/sem)	50		
Module Level	2	Semester of Delivery	3
Administering Department	Geology	College	Science
Module Leader	Dr. Lamees Nazar		e-mail
			lamees.nazar@sc.uobaghdad.edu.iq
Module Leader's Acad. Title	Assist. Prof	Module Leader's Qualification	PhD
Module Tutor		e-mail	
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/09/2025	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module		Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims	
أهداف المادة الدراسية	

	4. Raise the level of English language for the students, and help the student to improve their English language(speaking and writing). 5. Helping students to speak in English. 6. Training the student on writing different geologic subjects in English.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	4. Increasing the ability of student to apply what they learned from the grammar lecture in their writing. 5. Increasing the ability of student to apply what they learned from the grammar lecture in their speaking. 6. Encourage students to read and understand geologic papers in English.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. We have introduced you to the basic principles of stratigraphy. Let us now summarize what you have learned in this unit; 1.Learning English Can Help student to think More Creatively An additional language will increase your creativity levels. In the fifth benefit on our list, we pointed out the fact learning a second language can make the brain becomes more flexible thereby making it easier to switch between different tasks, promoting creativity 2. Learning English Can Help studentsIn Academia A science-based article recently revealed that the number of scientific papers written in English is now outnumbering those written in the researcher's native language. Therefore, having an understanding of the English language opens up a vast amount of knowledge that can be drawn upon during their studies.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	One of the primary benefits of learning English is that it is often considered the language of global business. The international business community often uses it for communication, even among people who do not speak the same native language. Speaking and understanding English can let a person more easily communicate with others and find more job opportunities not only in his or her home country, but around the world as well. There are also many professional informative publications printed in English, which means it is often an essential language for anyone working in science or research. Different learning styles could be applied in the class to improve the english language for the student.

	1. Divide the students into a number of groups and choose a geologic subject to discuss in English. 2. Listen to different types of lectures recorded in English to improve the students listening 3. Ask the student to prepare a short geologic report written in English in the class to evaluate their level in writing.
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Student Workload (SWL)			
الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	33	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	17	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	1
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	50		

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 8
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 9 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	8	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المناهج الأسبوعي النظري

Course Objectives:

1. To build upon the foundational English skills acquired in the first year, focusing on scientific contexts.
2. To improve students' ability to read and comprehend scientific texts.
3. To enhance writing skills for scientific reports, summaries, and essays.
4. To develop effective oral communication skills for presentations and discussions.
5. To expand vocabulary, including scientific terminology.

	Material Covered
Week 1	Review of Basic Grammar and Vocabulary • Revisiting basic grammar rules (sentence structure, tenses, subject-verb agreement). • Introduction to more complex sentence structures (compound and complex sentences).
Week 2	• Building vocabulary with a focus on science-related terms.
Week 3	Reading Comprehension of Scientific Texts • Strategies for reading and understanding scientific articles and textbooks.
Week 4	• Identifying main ideas, supporting details, and conclusions in texts. • Exercises in summarising and paraphrasing scientific information.
Week 5	Writing Skills for Science • Writing clear and concise sentences. • Paragraph structure: topic sentences, supporting details, and conclusions.
Week 6	• Introduction to writing scientific reports and essays. • Practice with short writing assignments.
Week 7	Introduction to Scientific Writing • Basic structure of scientific papers and lab reports.
Week 8	• Writing introductions, methods, results, and discussion sections. • Common mistakes in scientific writing at an intermediate level.
Week 9	Oral Communication and Presentation Skills • Fundamentals of public speaking in a scientific context. • Planning and organising presentations.
Week 10	• Using visual aids effectively (e.g., slides, charts). • Practicing short presentations on scientific topics.

Week 11	Technical Vocabulary and Language in Science - Expanding science-specific vocabulary. - Using technical terms correctly in context.
Week 12	- Exercises in using scientific terminology in writing and speech. - Understanding and using prefixes, suffixes, and root words common in scientific language.
Week 13	Practical Writing and Speaking Exercises - Writing a short research report or essay on a scientific topic. - Peer review and feedback sessions.
Week 14	- Preparing and delivering a final presentation on a scientific topic. - Role-playing exercises for group discussions and Q&A sessions.
Week 15	Revision and Final Assessment - Review of key concepts and skills learned during the course. - Practice exercises for the final exam. - Final presentations and peer evaluations.
Week 16	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	New Headway: Intermediate: Student's Book	Yes
Recommended Texts	"English for Science and Technology" by Louis Trimble. "Academic Vocabulary in Use" by Michael McCarthy and Felicity O'Dell. - Selected readings from scientific journals and textbooks relevant to students' fields.	Optional
Websites		
Additional Notes	- Active participation is crucial for improving language skills. - Regular attendance and completion of all assignments are required to pass the course. - Extra support will be provided for students needing additional help during office hours.	

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	ممتاز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
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MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Computer II		Module Delivery
Module Type	B		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	UOB-203		
ECTS Credits	3		
SWL (hr/sem)	75		
Module Level	2	Semester of Delivery	3
Administering Department	Geology	College	Science
Module Leader	Emad Jasim	e-mail	Emad.j@sc.uobaghdad.edu.iq
Module Leader's Acad. Title	Assistant Lecturer	Module Leader's Qualification	PhD
Module Tutor	Abdullah Adil	e-mail	abdullah.i@sc.uobaghdad.edu.iq
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/09/2025	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module		Semester	
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	Aims of learning Microsoft Excel: Basic Functionality: The aim is to provide students with a solid understanding of Excel's interface, navigation, and basic functionalities, enabling them to create, format, and manage spreadsheets effectively. Data Entry and Formatting: The aim is to teach students how to enter data, apply formatting, and use cell formatting options, such as number formats, font styles, colors, and borders, to enhance the visual appeal and organization of their spreadsheets. Formulas and Functions: The aim is to enable students to use formulas and functions in Excel to perform calculations, manipulate data, and automate tasks. They will learn how to write basic formulas, use functions like SUM, AVERAGE, and IF, and apply cell references. Data Analysis and Visualization: The aim is to introduce students to Excel's data analysis and visualization tools, such as sorting, filtering, and conditional formatting. They will learn how to create charts, graphs, and pivot tables to present and analyze data effectively. Data Manipulation and Management: The aim is to equip students with skills in manipulating and managing data in Excel. They will learn techniques like sorting, filtering, data validation, and data consolidation to organize and manipulate data efficiently. Aims of learning Microsoft PowerPoint: Creating and Formatting Slides: The aim is to enable students to create visually appealing slides using PowerPoint's formatting tools. They will learn how to select and customize slide layouts, apply themes, format text, and add multimedia elements like images and videos. Slide Design and Layout: The aim is to teach students how to design slides with effective layout and visual hierarchy. They will learn about slide transitions, animations, and master slides to create cohesive and engaging presentations. Content Creation and Organization: The aim is to develop students' skills in creating meaningful content for their presentations. They will learn how to outline and structure their presentation, create bulleted lists, insert tables, charts, and diagrams, and effectively use speaker notes. Slide Show Delivery: The aim is to equip students with the knowledge and techniques to deliver effective presentations using PowerPoint. They will learn how to navigate slide shows, use presenter view, rehearse timings, and employ effective delivery techniques. Visual Communication: The aim is to teach students how to effectively communicate information through visual elements in PowerPoint. They will learn how to use charts, graphs, and infographics to present data, and employ techniques like color, fonts, and imagery to enhance visual impact.
Module Learning Outcomes	Learning outcomes of Microsoft Excel: Data Management: Students will be able to efficiently manage and organize data using Excel, including entering data, creating tables, sorting, filtering, and applying data validation.

مخرجات التعلم للمادة الدراسية	Formulas and Functions: Students will have the skills to use formulas and functions in Excel to perform calculations, analyze data, and solve complex problems. Data Analysis: Students will be able to apply various data analysis techniques in Excel, such as creating charts and graphs, using pivot tables, and utilizing conditional formatting to visually represent and interpret data. Data Visualization: Students will have the ability to create visually appealing charts, graphs, and dashboards in Excel to present and communicate data effectively. Data Manipulation: Students will be able to manipulate data in Excel by using advanced features like text functions, logical functions, lookup functions, and data consolidation. Automation and Efficiency: Students will understand how to automate repetitive tasks and increase efficiency in Excel by utilizing features like macros, templates, and advanced data manipulation techniques. Learning outcomes of Microsoft PowerPoint: Presentation Creation: Students will be able to create well-structured and visually appealing presentations using PowerPoint, including selecting appropriate slide layouts, adding and formatting text, and incorporating multimedia elements. Slide Design and Visual Communication: Students will have the skills to design slides effectively, utilizing principles of visual communication, such as visual hierarchy, contrast, color schemes, and typography. Content Organization and Flow: Students will be able to organize and structure content in a logical and coherent manner, creating clear and engaging presentations with proper sequencing and transitions between slides. Slide Show Delivery: Students will understand how to deliver presentations confidently using PowerPoint, including using speaker notes, rehearsing timings, navigating through slides, and engaging the audience effectively. Data Presentation and Visualization: Students will have the ability to present data and complex information using charts, graphs, and other visual elements in PowerPoint, effectively conveying key messages and insights.
Indicative Contents المحتويات الإرشادية	Indicative contents of Microsoft Excel include the following topics: Introduction to Excel Overview of Excel's interface and features Navigating worksheets and workbooks Understanding the ribbon and menu options Data Entry and Formatting Entering and editing data in cells Formatting cells, including number formats, fonts, colors, and borders Applying cell styles and themes Formulas and Functions Creating basic formulas for calculations Using built-in functions, such as SUM, AVERAGE, COUNT, and IF Working with absolute and relative cell references Data Analysis and Manipulation Sorting and filtering data Using conditional formatting to highlight data based on criteria Working with tables and structured references

	Charts and Graphs Creating different types of charts, such as column, line, pie, and bar charts Customizing chart elements, including titles, labels, and legends Using chart tools for data analysis and visualization Data Validation and Protection Applying data validation rules to control data entry Protecting worksheets and workbooks with passwords Hiding and protecting formulas and sensitive information PivotTables and PivotCharts Creating PivotTables to summarize and analyze large datasets Modifying and formatting PivotTables Creating PivotCharts based on PivotTable data Advanced Functions and Formulas Working with advanced functions, such as VLOOKUP, SUMIF, COUNTIF, and CONCATENATE Using logical functions like IF, AND, and OR for conditional calculations Combining functions to perform complex calculations Data Analysis Tools Using built-in data analysis tools, such as Goal Seek, Solver, and Scenario Manager Creating and analyzing data tables and what-if analysis Data Import and Export Importing data from external sources, such as databases or CSV files Exporting data to different file formats, including PDF and CSV Indicative contents of learning Microsoft PowerPoint include the following topics: Introduction to PowerPoint Overview of PowerPoint's interface and features Navigating slides and slide layouts Understanding the ribbon and menu options Creating and Editing Slides Adding, deleting, and rearranging slides Choosing slide layouts and applying slide themes Inserting and formatting text boxes, shapes, and images Slide Design and Layout Applying consistent design elements, such as fonts, colors, and backgrounds Aligning and arranging objects on slides Using slide masters and layouts for consistent branding Visual Elements and Multimedia Inserting and formatting images, icons, and illustrations Adding and formatting charts, graphs, and tables Incorporating multimedia elements like audio and video Text Formatting and Styling Formatting text, including font styles, sizes, colors, and effects Applying text alignment, indentation, and line spacing
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	Using bullet points and numbered lists effectively Slide Transitions and Animations Applying slide transitions for smooth visual effects between slides Adding entrance, exit, and emphasis animations to objects and text Timing and sequencing animations for dynamic slide shows SmartArt Graphics and Diagrams Creating and customizing SmartArt graphics for visual representation of information Inserting and modifying diagrams, such as organizational charts and flowcharts Adding text and formatting options to SmartArt and diagrams Slide Show Delivery and Navigation Delivering a slide show effectively, including using presenter view and slide show controls Navigating through slides, sections, and hidden slides Using slide show tools for annotations, pen and highlighter options Slide Show Customization and Interactivity Customizing slide show settings, such as timings, looping, and narration Creating hyperlinks to other slides, websites, or files Using action buttons and triggers for interactive presentations Collaboration and Sharing Collaborating on presentations by using co-authoring and commenting features Sharing presentations with others and managing access permissions Exporting presentations to different file formats, such as PDF or video
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Hands-on Practice: Emphasize practical exercises and hands-on activities where learners actively engage with the software. Provide step-by-step instructions and guided practice opportunities to ensure learners gain experience. Demonstration: Start by demonstrating key features and functionalities of Excel and PowerPoint. Use screen sharing or projection to show learners how to navigate the interface, perform tasks, and utilize various tools and options effectively. Interactive Tutorials and Simulations: Utilize interactive tutorials and simulations that allow learners to interact in a simulated environment. These resources provide guided instructions and immediate feedback, enabling learners to practice and reinforce their skills. Scenario-based Learning: Present real-life scenarios where learners can apply their knowledge to solve problems or complete specific tasks. Encourage critical thinking and problem-solving skills by challenging learners to find solutions using the software. Group Activities and Discussions: Foster collaboration and peer learning by incorporating group activities and discussions. Encourage learners to share their experiences, ask questions, and help each other troubleshoot issues or explore advanced features. Multimedia Resources: Supplement traditional instruction with multimedia resources such as video tutorials, interactive e-learning modules, and online resources. These

	resources can provide additional explanations, demonstrations, and visual aids to enhance understanding and retention of the content. Practice Projects and Assignments: Assign practical projects or assignments that require learners to apply their skills to create documents, presentations, or other tasks. Provide clear objectives and guidelines, and encourage creativity to promote active learning. Assessments and Feedback: Use formative and summative assessments to gauge learners' understanding and progress. Provide constructive feedback on their work to highlight areas for improvement and reinforce correct practices. Adaptability and Differentiation: Recognize the diverse needs and learning styles of learners and adapt the instruction accordingly. Provide differentiated instruction, additional resources, or alternative learning paths to cater to individual learners' abilities and preferences.
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Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	49	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	26	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	75		

Module Evaluation تقييم المادة الدراسية					
As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 8
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2hr	10% (10)	8	LO # 1-7
	Final Exam	2hr	50% (50)	16	All

Total assessment	100% (100 Marks)		
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Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	Material Covered
Week 1	Excel 2016 – File Tab
Week 2	Excel 2016 – Home Tab
Week 3	Excel 2016 – Insert Tab
Week 4	Excel 2016 – Chart Properties
Week 5	Excel 2016 – Page Layout Tab
Week 6	Excel 2016 – Formula Tab
Week 7	Excel 2016 – Data Tab
Week 8	Excel 2016 – Review + View Tab
Week 9	Midterm Exam 1
Week 10	Power Point 2016 – File Tab
Week 11	Power Point 2016 – Home Tab
Week 12	Power Point 2016 – Insert Tab
Week 13	Power Point 2016 – Design + Transitions Tab
Week 14	Power Point 2016 – Animations + Slide Show
Week 15	Midterm Exam 2

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week	Material Covered
Week 1	Lab1: Excel 2016 – File Tab

Week 2	Lab2: Excel 2016 – Home Tab
Week 3	Lab3: Excel 2016 – Insert Tab
Week 4	Lab4: Excel 2016 – Chart Properties
Week 5	Lab5: Excel 2016 – Page Layout Tab
Week 6	Lab6: Excel 2016 – Formula Tab
Week 7	Lab7: Excel 2016 – Data Tab
Week 8	Lab8: Excel 2016 – Review + View Tab
Week 9	Midterm Exam 1
Week 10	Lab9: Power Point 2016 – File Tab
Week 11	Lab10: Power Point 2016 – Home Tab
Week 12	Lab11: Power Point 2016 – Insert Tab
Week 13	Lab12: Power Point 2016 – Design + Transitions Tab
Week 14	Lab13: Power Point 2016 – Animations + Slide Show
Week 15	Midterm Exam 2

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	1. Excel 2016 quick reference 2. PowerPoint 2016 quick reference	No
Recommended Texts		No
Websites	The official Microsoft Support website https://support.microsoft.com/en-us my official youtube channel	

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.



Ministry of Higher Education and
Scientific Research - Iraq
University of Baghdad
College of Sciences
Department of Geology



جامعة بغداد / كلية العلوم
قسم علم الارض
مواد المرحلة الثانية
الفصل الدراسي الثاني

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Invertebrate Fossils II		Module Delivery
Module Type	Core		Theory
Module Code	GEO-24012		☒ Lecture
ECTS Credits	5		☒ Lab
SWL (hr/sem)	125		☐ Tutorial
			☐ Practical
			☒ Seminar
Module Level	2	Semester of Delivery	4
Administering Department	Geology	College	Science
Module Leader	AfraH H. Saleh AL-Ekabi	e-mail	afrah.hsaleh@sc.uobaghdad.edu.iq
Module Leader's Acad. Title	Assistant Professor	Module Leader's Qualification	Ph.D.
Module Tutor	dr. Anwar Khadem	e-mail	anwar.mousa@sc.uobaghdad.edu.iq
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/10/2025	Version Number	1.0

Module Aims, Learning Outcomes and Indicative Contents	
اهداف المادة الدراسية ونتائج التعلم والمحتويات الارشادية	
Module Aims اهداف المادة الدراسية	1- This module on individual projects and provides the students more information about the main phylum of animals. 2- Training the student to understand the shapes, modes of preservation, classification, nomenclature of species and genera.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. beneficialness the specifying geological time then educing the paleo environment. 2. Acquiring the skill of distinguishing between different geological formations. 3. Dealing with the basic laws of various earth sciences. 4. Using the principle of the past as a key to the present in reconstructing the geological history of the earth's formation and development.
Indicative Contents المحتويات الارشادية	1. Invertebrate Fossils is a branch of Geology which deals with an animal without a backbone. In fact, invertebrates don't have any any bones at all! Invertebrates that you may be familiar with include spiders, worms, snails, lobsters, crabs and insects like butterflies. However, humans and other animals with backbones are vertebrates. It focuses primarily on stratified phylum of animals that includes

	types of marine organisms & Mode of life [15 hrs] 2. The principles on which the Invertebrate Fossils studies are based include order variety phylum of animals, [15 hrs]. 3. an organism must be an animal to be classified as an invertebrate, meaning they are members of the kingdom Animalia. [15 hrs]. 4. the species in question must lack a notochord during embryonic development and a backbone, also called a spine, and a spinal cord. 5. The majority of living animals are invertebrates. Invertebrates lack a backbone. [15 hrs]. 6. Invertebrates may have an incomplete or a complete digestive system. 7. Invertebrates vary in how they move and in the complexity of their nervous system. And Most invertebrates reproduce sexually. [15 hrs]. 8. They bring beauty into our lives, ensure we have food on our plates, and are at the heart of a healthy environment. The services they perform—pollinating, dispersing seeds, becoming food for wildlife, recycling nutrients, cleaning water, building reefs—are critical to life on our planet.
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Hands-on Experience: Hands-on experience allows students to develop observational skills, make connections between theoretical concepts and real-world examples, and enhance their understanding of stratigraphic principles. 2. Visual Aids: Utilize visual aids, such as diagrams, charts, maps, and photographs, to help students visualize and comprehend stratigraphic concepts. 3. Virtual Resources: Take advantage of virtual resources, such as interactive online modules. These resources can provide students with immersive experiences, allowing them to explore stratigraphic principles and study geological features virtually. 4. Case Studies and Real-life Examples: Present case studies and real-life examples that illustrate the application of stratigraphic principles in various contexts, such as paleoenvironmental reconstructions, or geological hazard assessments. These examples can help students understand the practical significance of the course. 5. Laboratory Work: Conduct laboratory exercises that involve the description and interpretation of samples. Encourage students to the laboratory data. 6. Collaborative Learning: Foster collaborative learning environments where students can work in groups or pairs to solve problems, analyze data. This approach encourages active engagement, promotes discussions, and allows students to learn from one another's perspectives and insights. 7. Multimedia Resources: Incorporate multimedia resources, such as videos, animations, and online lectures, to supplement traditional teaching methods. Multimedia resources can help reinforce key concepts. 8. Allows students to monitor their progress, identify areas of improvement, and reinforces learning. 9. Integration of Technology: Utilize geospatial software, stratigraphic modeling tools, and other technology-based resources to enhance the learning experience

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem)	46	Unstructured SWL (h/w)	3

الحمل الدراسي غير المنتظم للطالب خلال الفصل		الحمل الدراسي غير المنتظم للطالب أسبوعيا	
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 8
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2hr	10% (10)	8	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	Material Covered
Week 1	Introduction of Paleontology
Week 2	Modes of Preservation
Week 3	Taphonomy & Preservation
Week 4	Foraminifera
Week 5	Radiolaria
Week 6	Phylum Porifera (Sponge)
Week 7	Phylum Coelentrata (Cnidaria)
Week 8	Phylum Bryozoa
Week 9	Phylum Brachiopoda
Week 10	Phylum Mollusca / Class Pelecypoda (Bivalvia)
Week 11	Class Gastropoda
Week 12	Class Cephalopoda
Week 13	Phylum Arthropods

Week 14	Phylum Echinodermata
Week 15	Phylum Graptolites
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week	Material Covered
Week 1	Lab 1: Modes & Types of Preservation
Week 2	Lab 2: Foraminifera
Week 3	Lab 3: Radiolaria
Week 4	Lab 4: Phylum Porifera (Sponge)
Week 5	Lab 5: Phylum Coelentrata (Cnidaria
Week 6	Lab 6: Phylum Bryozoa
Week 7	Lab 7: Phylum Brachiopoda
Week 8	Lab 8: Phylum Mollusca / Class Pelecypoda (Bivalvia)
Week 9	Lab 9: Class Gastropoda
Week 10	Lab 10: Phylum Arthropods / Trilobites
Week 11	Lab 11: Phylum Echinodermata
Week 12	Lab 12: Phylum Graptolites
Week 13	Preparatory week before the final Exam

Learning and Teaching Resources مصادر التعلم والتدريس	
References	Text

Required Texts	1. Fossils and Evolution – The theory and its supporting evidence د. عامر الخفاجي 2. Foraminifera – جوزيف كوشمان 3. principles of paleontology. Moore
Recommended Texts	مبادئ علم المستحاثات او المتحجرات شفيق مهدي
Websites	http://www.sepmstrata.org/page.aspx?pageid=229

Grading Scheme				
مخطط الدرجات				
Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Petrology		Module Delivery
Module Type	Core		☒ Theory
Module Code	GEO-24013		Lecture
ECTS Credits	5		☒ Lab
SWL (hr/sem)	125		Tutorial
			Practical
			Seminar
Module Level	2	Semester of Delivery	4
Administering Department	Geology	College	Science
Module Leader	Dr. Safaa Adeeb	e-mail	safaa.a@sc.uobaghdad.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor	Dr. Hadi Salim	e-mail	hadi.s@sc.uobaghdad.edu.iq
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/10/2025	Version Number	1.0

Module Aims, Learning Outcomes and Indicative Contents	
اهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims اهداف المادة الدراسية	1. Contribute to the process of scientific progress, raise the level of education, and provide the labor market with graduates to work in all fields of the country's rocks, mineral and environmental investment. 2. Petrology deals with mineralogical and textural parameters for different rock types classification and physical –chemical conditions for the formation of these rocks in with different aspects of parent rocks . 3. Training the student on the most important methods of determining the type of rock depending on mineralogical and textural classification , and the relationship of the rocks to each other this is the key to discovery and development of minerals resources ,and because fundamental principles learned from petrology have applications in modern industry.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Acquiring the ability and skill in field interpretation and elicitation. 2. Acquiring the skill of distinguishing between different minerals and rock tyoes. 3. Dealing with the basic laws of various earth sciences. 4. Using the principle of the past as a key to the present in reconstructing the geological history of the earth's formation and development.

Indicative Contents المحتويات الإرشادية	1. Petrology is a branch of Geology which deals with the types of rocks in relation to the way of their formation. 2. It focuses primarily on rocks that include igneous, sedimentary, and metamorphic rock. It also includes study the relationship between them [15 hrs] 3. The principles on which the petrologic studies are based include order of Rock types, its classification, textural and minerals composition, [15 hrs]. 4. Scientific study of rocks that deals with their composition, texture, and structure; their occurrence and distribution ; and their origin in relation to physicochemical lconditions and geological processes [15 hrs]. 5. It is concerned with all three types of rocks –igneous, sedimentary and metamorphic .[15 hrs]. 6. Petrology includes the subdisciplines of experimental petrology and petrography experimental petrology involves the laboratory synthesis of rocks for the purpose of ascertaining the physical and chemical conditions under which rock formation occurs 15 hrs].
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Fieldwork and Hands-on Experience: Fieldwork is an essential component of petrology. Engage students in field trips or field-based exercises where they can observe and analyze rock outcrops, interpret sedimentary structures, and collect samples. Hands-on experience allows students to develop observational skills, make connections between theoretical concepts and real-world examples, and enhance their understanding of stratigraphic principles. 2. Visual Aids: Utilize visual aids, such as diagrams, charts, maps, and photographs, to help students visualize and comprehend petrology m concepts. Use geological maps to demonstrate the distribution and relationships between different rock units and incorporate stratigraphic columns to illustrate the vertical succession of strata. 3. Virtual Resources: Take advantage of virtual resources, such as interactive online modules, virtual field trips, and digital simulations. These resources can provide students with immersive experiences, allowing them to explore stratigraphic principles and study geological features virtually. 4. Case Studies and Real-life Examples: Present case studies and real-life examples that illustrate the application of stratigraphic principles in various contexts, such as oil and gas exploration, paleoenvironmental reconstructions, or geological hazard assessments. These examples can help students understand the practical significance of petrology and its relevance in different disciplines. 5. Laboratory Work: Conduct laboratory exercises that involve the description and interpretation of rock samples, including the identification of lithology,mineralogy , sedimentary structures, and fossil content. Encourage students to determine the texture and classification of hand specimen . 6. Collaborative Learning: Foster collaborative learning environments where students can work in groups . This approach encourages active engagement, promotes discussions, and allows students to learn from one another's perspectives and insights. 7. Multimedia Resources: Incorporate multimedia resources, such as videos, animations, and online lectures, to supplement traditional teaching methods. Multimedia resources can help reinforce key concepts, illustrate geological processes, and provide additional visual and auditory learning

	opportunities. 8. Concept Mapping: Encourage students to create charts or diagrams that depict the relationships between different petrology concepts, principles, and processes. . 9. Continuous Assessment and Feedback: Implement regular assessments, such as quizzes, assignments, or class discussions, to gauge student understanding and provide timely feedback. This allows students to monitor their progress, identify areas of improvement, and reinforces learning. 10. Integration of Technology: Utilize geospatial software, stratigraphic modeling tools, and other technology-based resources to enhance the learning experience. These tools can facilitate data analysis, visualization, and interpretation, providing students with valuable skills applicable to the field of petrology.
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Student Workload (SWL)			
الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	46	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	125		

Module Evaluation					
تقييم المادة الدراسية					
As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 8
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10

Summative assessment	Midterm Exam	2hr	10% (10)	8	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Petrology
Week 2	Rock Forming Minerals
Week 3	Igneous Rocks
Week 4	Texture of igneous rocks
Week 5	Mineralogy of igneous rocks
Week 6	Bowen Reaction Series
Week 7	Structures of igneous rocks
Week 8	Sedimentary Rocks
Week 9	Textures of sedimentary rocks
Week 10	Mineralogy of sedimentary rocks
Week 11	Sedimentary structures
Week 12	Metamorphic Rocks
Week 13	Textures of Metamorphic rocks
Week 14	Mineralogy of Metamorphic rocks
Week 15	Structures of Metamorphic rocks
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Introduction to Petrology
Week 2	Lab 2: rock forming minerals
Week 3	Lab 3: Igneous Rocks
Week 4	Lab 4: Bowen Reaction Series
Week 5	Lab 5: Textures of igneous rocks

Week 6	Lab 6: Mineralogy of igneous rocks
Week 7	Lab 7: Sedimentary Rocks
Week 8	Lab 8: Mineralogy of Sedimentary Rocks
Week 9	Lab 9: Textures of Sedimentary Rocks
Week 10	Lab 10: Metamorphic Rocks
Week 11	Lab 11: Mineralogy of Metamorphic Rocks
Week 12	Lab 12: Textures of Metamorphic Rocks
Week 13	Lab 13: Practical Examination
Week 14	
Week 15	

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Raymond, 2009: The Study of Igneous, Sedimentary and Metamorphic Rocks.	
Recommended Texts	Hyndman: Petrology of Igneous and Metamorphic Rocks	
Websites	WWW.Geology.com	

Grading Scheme				
مخطط الدرجات				
Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
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	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 - 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Structural Geology II		Module Delivery
Module Type	Core		☒ Theory
Module Code	GEO-24014		Lecture
ECTS Credits	5		☒ Lab
SWL (hr./sem)	125		Tutorial
			Practical
			Seminar
Module Level	2	Semester of Delivery	4
Administering Department	Geology	College	Science
Module Leader	Dr. Atheer Idan Khalil	e-mail	atheer.khalil@sc.uobaghdad.edu.iq
Module Leader's Acad. Title	Assistant Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Dr. Janan Mansour Gorael Sally Hussein	e-mail	Janan.gorael@scbaghdad.edu.iq sally.h@sc.uobaghdad.edu.iq
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/10/2025	Version Number	1.0

Module Aims, Learning Outcomes and Indicative Contents	
اهداف المادة الدراسية ونتائج التعلم والمحتويات الارشادية	
Module Aims اهداف المادة الدراسية	- The primary goal of structural geology is to use measurements of present-day rock geometries to uncover information about the history of deformation (strain) in the rocks, and ultimately, to understand the stress field that resulted in the observed strain and geometries. - Also to understand the structural evolution of a particular area due to plate tectonics. - Understanding of the structure (geometry) of the underlying rocks is vitally important in the mining and petroleum industries. - Recognize, classify, measure, record and analyze geological structures at a variety of scales and represent them in field note books and upon geological maps, sections and stereograms.
Module Learning Outcomes	Understand and describe the features formed in rocks when subject to stress, analyze the strain in these rocks and interpret the Paleostress field that affected the rock and caused the deformation

مخرجات التعلم للمادة الدراسية	• know the brittle, ductile and plastic deformation • understand deformation mechanisms at micro- and macro-scales • describe the geometry and properties of different deformation structures • run structural fieldwork and use structural field data in geometrical and kinematic analyses • Visualize and interpret structural observations and measurements.
Indicative Contents المحتويات الإرشادية	• An understanding of stress and its origins within the lithosphere. • An understanding of strain as it relates to naturally occurring deformation. • To observe deformed rocks and find an explanation for how and why they ended up in their present state. • To understand under which physical condition the rock was formed and how the structures were made. Small models are being demonstrated how stress, strain, temperature, and pressure worked.
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	• Inquiry-based learning, where students explore a question or problem through observation, experimentation, or data analysis. • Peer instruction, where students answer questions and explain their reasoning. • Cooperative learning, which has students work in small groups to complete a task. • During class time, interactive activities, discussions are used.

Student Workload (SWL) الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	46	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 8
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2hr	10% (10)	8	LO # 1-7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Interpretation of structure geology
Week 2	The fold and the elements of fold
Week 3	Classification of fold
Week 4	Classification of fold based on the thickness of layers
Week 5	Dynamics of fold
Week 6	The fractures and types of fractures
Week 7	The joints
Week 8	Classification of joints
Week 9	The faults
Week 10	Elements of faults
Week 11	Classification of faults
Week 12	The genetic classification of faults
Week 13	Mechanical of faults
Week 14	Criteria of faults
Week 15	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الأسبوعي للمختبر

	Material Covered
Week 1	Introduction by using stereographic projection of the structural plane
Week 2	Determination of true dip and strike line from two apparent dips
Week 3	Determination of apparent dip from strike line and true dip
Week 4	Determination the true dip from strike line and the apparent dip
Week 5	Determination the elements of fold(plunging, fold axis, axial plane and inter limb angle)
Week 6	Define the terms of Descriptive geometry
Week 7	True dip from strike and apparent dip
Week 8	True dip from two apparent dip
Week 9	Determination of strike and true dip from three points
Week 10	Determination the thickness and depth of strata
Week 11	Line of intersection
Week 12	Vertical fault
Week 13	Inclined fault
Week 14	Determination the stress on the fault
Week 15	Preparatory week before the final Exam

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Structural geology for Marland P. Billings	Yes
Recommended Texts		No
Websites		

Grading Scheme				
مخطط الدرجات				
Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (فقد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Remote Sensing		Module Delivery
Module Type	Core		☒ Theory
Module Code	GEO-24015		Lecture
ECTS Credits	4		☒ Lab
SWL (hr/sem)	100		Tutorial
			Practical Seminar
Module Level	2	Semester of Delivery	4
Administering Department	Geology	College	Science
Module Leader	muaid jassim Rasheed	e-mail	muayid.j@sc.uobaghdad.edu.iq
Module Leader's Acad. Title	Assistant professor	Module Leader's Qualification	Ph.D.
Module Tutor	Zainab Damad Hassan	e-mail	zainab.hassan@sc.uobaghdad.edu.iq
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/10/2025	Version Number	1.0

Module Aims, Learning Outcomes and Indicative Contents	
اهداف المادة الدراسية ونتائج التعلم والمحتويات الارشادية	
Module Aims اهداف المادة الدراسية	- This module aims to review fundamentals of Remote Sensing & Aerial survey. - The purpose of this module is to prepare students for the development and - Analysis of remote sensing data sets, which are essential to Geomorphology, Hydrology, Environment and many branches of Geology.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	- When applying and using remote sensing science in geology, we can - understand the topographic and geomorphological reality of vegetation and - land cover, patterns of water drainage, rivers and soils, pollution in the air, water and soil, the nature of minerals and rocks, and many outcomes of the - great development that has occurred in this field, which saves effort and - money in a very short time.
Indicative Contents	Guiding students on the importance of remote sensing as an applied science and an important tool for many branches of geology.

المحتويات الإرشادية	
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	It depends on reviewing lectures as well as understanding and skill in using remote sensing programs, and here is the ERDAS program

Student Workload (SWL) الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	21	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	1.3
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	100		

Module Evaluation تقييم المادة الدراسية					
As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 8
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2hr	10% (10)	8	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction in photography
Week 2	Kind of photography
Week 3	Scales of photography
Week 4	Introduction to fundamentals (R.S.)
Week 5	The electromagnetic spectrum
Week 6	Electromagnetic Radiation
Week 7	Interactions with the atmosphere
Week 8	Midterm Exam (1)
Week 9	Radiation
Week 10	Characteristics of images

Week 11	Satellites characteristics
Week 12	Sensors
Week 13	Resolution
Week 14	Image processing
Week 15	Image classification
Week 16	Exam 2

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Introductions to aerial image ,History and Important.
Week 2	Lab 2: Definition of the aerial image, its components, types, the difference between the vertical and the oblique image, the scale of the image.
Week 3	Lab 3: Definition of the satellite image, its components, specifications, definition of the regions of the electromagnetic spectrum. Introduction to the erdas program.
Week 4	Lab 4: image information. Profile, pixel data, histogram.
Week 5	Lab 5: How to subset an image of a regular and irregular area.
Week 6	Lab 6: Enhancement.

Week 7	Lab 7: Exam 1
Week 8	Lab 8: Layer stack
Week 9	Lab 9: Mosaic
Week 10	Lab 10: Unsupervised classification
Week 11	Lab 11: Supervised classification
Week 12	Lab 12: Geometric correction of the image
Week 13	Lab 13: Normalized difference vegetation and water index
Week 14	Lab 14: How to change the overlay of channels, how to combine a multispectral image such as Landsat 30m with an image with high spatial resolution such as SPOT.
Week 15	Lab 15: Exam 2

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Fundamentals of Remote Sensing. Natural Recourse's Canada .Canada center for remote sensing.	Yes
Recommended Texts	Remote Sensing Geology by Ravi P.Gupta	Yes
Websites	Accessing scientifically websites from Wikipedia or universities (lectures and videos).	

Grading Scheme				
مخطط الدرجات				
Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Sedimentology		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	GEO-24016		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	2	Semester of Delivery	4
Administering Department	Geology	College	Science
Module Leader	Hasan Kattoof Jasim	e-mail	Hasan.jasim@sc.uobaghdad.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor	Hiba Saadon	e-mail	hiba.saadon@sc.uobaghdad.edu.iq
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/10/2025	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	5. Sedimentology aims to identify the types of loose sediments, how they are formed, the way they are transported, and the places and environments in which they deposition. 6. Introducing the importance of sedimentology, which is the link between earth science and all natural, medical and engineering sciences, agricultural and pure sciences
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	5- Training in identifying and diagnosing the types of sediments of sediment, chemical and organic 6- Training on the skills of dealing with different types of sediment and mastering how to study its physical and chemical properties 7- Mastering the most important applications needed by all engineering scientific disciplines and pure sciences that deal with sediment of all kinds and its industrial and engineering applications.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. We have introduced you to the Mineralogy. Let us now summarize what you have learned in this unit; 7- Identifying the types of sediments, which are clearly seen during field work and reconnaissance field trips. 8- Sedimentology are among the most important branches of earth science and have important applications in many engineering and scientific fields 9- Iraq has a huge amount of sediments, so students must understand and understand how to deal with sediments, the way to deal with them in geological workshops and in the field , how to make slides for these sediments and rocks, and how to study them under a polarizing microscope

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	When it comes to learning and teaching Mineralogy, it is important to employ various strategies that cater to different learning styles and maximize understanding and retention. Here are some effective learning and teaching Mineralogy: 10- Training on the skills of collecting samples for sediment from the field and how to deal with them in the laboratory and geological workshop. 11- Mastering the process of preparing samples for the various types of analyses that can be conducted on sediment and sedimentary rocks. 12- Thinking about the applications that can be made on sediments, which are considered one of the most important requirements of most applied research. 13- Sediments have many applications, in addition to their engineering and industrial importance, as there are many of them that are considered precious stones, as well as being the basic component of many geological museums and what is known as geological parks and geoparks.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	46	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

	Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11

Formative assessment	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 8
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	8	LO # 1-7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Sedimentology – How are sediment formed
Week 2	Field Technique and Collection of Samples
Week 3	Types of sediment , clastic, chemical , organic and their main properties
Week 4	Sedimentary Environments
Week 5	The physical processes of sediments, especially the methods of transport and sedimentation
Week 6	Texture of Sediments (Grain size , Shape, and Sorting of Sediments)
Week 7	Main Technique of Grain Size
Week 8	Mid Theoretical Examination
Week 9	Shape of Sediments
Week 10	Stability and Maturity of Sediments
Week 11	Dust Storms
Week 12	Main Technique of Mineral Separation
Week 13	Sedimentary Structures

Week 14	Application of Sedimentology
Week 15	Final Theoretical Examination

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Introduction , Classification and Types of Sediments
Week 2	Lab2: Presentation of Sedimentological Data
Week 3	Lab 3: Grain Size of Mixture of sediments
Week 4	Lab 4: Grain Size Analysis of gravels
Week 5	Lab 5: Grain Size Analysis of Sand by Sieving
Week 6	Lab 6: Grain Size analysis Of sand from thin section
Week 7	Lab 7: Grain Size Analysis of Mud Fraction by Pipette Analysis
Week 8	Lab 8: Mid Examination of Sedimentology
Week 9	Lab 9 : Shape analysis of Gravels
Week 10	Lab 10: Shape Analysis of Sand from Thin Section
Week 11	Lab 11: Heavy Mineral Analysis
Week 12	Lab 12: Paleocurrent Analysis
Week 13	Lab 13: Sedimentological Section and Facies Analysis
Week 14	Lab 14: Clay Mineralogy
Week 15	Lab 15: Final Practical Examination of Sedimentary Rocks

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Folk, R., 1974, Petrology of Sedimentary Rocks. Hamphill, Texas, 182P.	Yes
Recommended Texts	Selley, R. C., 2000, Applied sedimentology, Academic Press, 521P.	Yes
Websites	https://www.cliffsnotes.com/study-guides/geology/sedimentary-rocks/clastic-sedimentary-rocks	

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM

وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Statistics		Module Delivery
Module Type	B		☒ Theory
Module Code	GEO-24017		Lecture
ECTS Credits	4		Lab
SWL (hr./sem)	100		Tutorial
			Practical
			Seminar
Module Level	2	Semester of Delivery	4
Administering Department	Mathamtics	College	Science
Module Leader	Dina Sultan	e-mail	dina.s@sc.uobaghdad.edu.iq
Module Leader's Acad. Title		Module Leader's Qualification	Ph.D.
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	01/10/2025	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	—
Co-requisites module	None	Semester	—

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	

Module Aims أهداف المادة الدراسية	To provide students with a solid foundation in Calculus at degree level and equip them with a knowledge of the necessary methods and techniques in applied mathematics for further study. It deals with the basic concept of functions limit, continuity, derivation and their consequences. To develop problem solving skills and understanding of differentiation rules through the application.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Students will become familiar with functions and limits. They will gain an understanding of convergence of sequences and series, and understanding of the foundations of differentiation and integration. Students will be able to compute limits of sequences and series, find derivatives, integrate elementary functions. Students will have enhanced skills in the following areas: modelling, spatial awareness, abstract reasoning and numeracy.
Indicative Contents المحتويات الإرشادية	The course will supply the students with basic concepts of differentiation (chain, product, quotient). Derivatives of standard functions (powers, polynomials, trigonometric). The exponential function: and logarithm as inverse. Derivatives of inverse functions via chain rule, local extrema and curve sketching.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL)			
الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	67	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.47
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	20% (20)	5, 10	1, 3 and 13
	Assignments	2	20% (20)	2, 12	2, 6 and 10
	Projects / Lab.	0	0	—	—
	Report	0	0	—	—
Summative assessment	Midterm Exam	2 hr.	10% (10)	8	1-7
	Final Exam	3 hr.	50% (50)	17	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المناهج الأسبوعي النظري	
	Material Covered
Week 1	Basic concepts: sets, lines, circles and functions.
Week 2	Domain, range and inverse of functions.
Week 3	Derivative: motivation, informal definition of limit
Week 4	Limits properties
Week 5	Continuity
Week 6	Trigonometric functions, their target and continuity
Week 7	Derivative rules of elementary functions
Week 8	Mid-term Exam + Discussion
Week 9	Derivatives of trigonometric and inverse trigonometric functions
Week 10	Applications of derivative; maximum and minimum
Week 11	Mean value theorem with applications

Week 12	Roll's theorem with applications
Week 13	Introduction to L'Hospital's rule
Week 14	Graph sketching
Week 15	Review
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
None	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Thomas Calculus, Joel R. Hass, Maurice D. Weir, 15th edition (2022).	Yes
Recommended Texts	Differential calculus and their applications, M. Barun, 3 rd edition, Applied mathematical sciences.	No
Websites	https://www.sciencebooksonline.info/mathematics.html	

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A – Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C – Good	جيد	70 - 79	Sound work with notable errors
	D – Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E – Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (فقد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Arabic Language II		Module Delivery	
Module Type	B		☒ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	UOB-201			
ECTS Credits	2			
SWL (hr/sem)	50			
Module Level	2	Semester of Delivery		4
Administering Department	Geology	College	Science	
Module Leader	Dr. Leqaa faleh owdaa		e-mail	leqaa.falih@ircoedu.uobaghdad.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.	
Module Tutor	Name (if available)		e-mail	E-mail
Peer Reviewer Name	Kamal Kareem Ali	e-mail	kamal.ali@sc.uobaghdad.edu.iq	
Scientific Committee Approval Date	01/10/2025	Version Number	1.0	

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	

Module Objectives أهداف المادة الدراسية	1- تعلم مهارات الكتابة والإملاء والتعبير الصحيح خلال تطبيق قواعد اللغة العربية بشكل مفصل وتطبيقي على نصوص عربية. 2- لفهم الجمع وأنواع الاسماء وكيفية التعامل معها. 3- لفهم العدد واستعماله بشكل صحيح من حيث المطابقة والمخالفة للتفريق بين الضاد والظاء. 4- للتفريق ومعرفة استعمال التاء المربوطة والتاء الطويلة. 5- التمييز بين العلامات الأصلية والفرعية. 6- تعلم استعمال الأدوات وعمل كل أداة ومعناها في التعبير.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	هام: اكتب 6 مخرجات تعليمية على الأقل، ومن الأفضل أن تكون مساوية لعدد أسابيع الدراسة 1- التعرف على كيفية جمع الأسماء وأنواع الجموع وسبب اختلافها وقائمة بالمصطلحات المختلفة المرتبطة ببلاغة اللغة العربية تعلم كتابة الهمزة وأنواعها. 2- وصف عمل الجمل الفعلية وأنواع الأفعال 3- ناقش وتفاعل ومشاركة قواعد الجمل الاسمية وعلامات الاعراب الأصلية والفرعية والتطبيقات ضمن نصوص أدبية وقرائية. 4- القدرة على استعمال علامات الترقيم في كتابة البحوث والتقارير . 5- التمييز بين الأدوات وأسلوب العطف والجر. 6- التعرف على قواعد اللغة العربية الأساسية وتطبيقاتها.
Indicative Contents المحتويات الإرشادية	يتضمن المحتوى الإرشادي ما يلي. مقدمة في البداية التي أسس لها علماء اللغة العربية وكيف بدأت كتابة المؤلفات بالمعاجم والقواعد وجمع اللهجات واستقراء اللغة وحركة الترجمة والفتوحات وتطور اللغة. ومشكلات المراجعة (6 ساعات) ودراسة الجمل وأنواعها والأفعال والعلامات الأصلية والفرعية والعدد. ومشكلات الكتابة والإملاء التي يقع فيها الطلبة في التفرقة بين الضاد والظاء والتاء المربوطة والطويلة والهمزة وأنواعها وكيفية كتابتها. (6 ساعات) ودراسة الموضوعات الصرفية التي تخص المشتقات من اسم الفاعل واسم المفعول وصيغة المبالغة وأوزانها ومعانيها وصيغها السماعية والقياسية.. وعلامات الترقيم وكيفية توظيفها في كتابة التقارير والبحوث والمخطوطات. (6 ساعات)

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	كتب شيئاً مثل: الاستراتيجية الرئيسية التي سيتم تبنيها في تقديم هذه الوحدة هي تشجيع الطلاب على المشاركة في التمارين، مع تحسين مهارات التفكير النقدي وتوسيعها في نفس الوقت. سيتم تحقيق ذلك من خلال الفصول والبرامج التعليمية التفاعلية ومن خلال النظر في أنواع التجارب البسيطة التي تتضمن بعض أنشطة أخذ العينات التي تهتم الطلاب.

Student Workload (SWL) الحمل الدراسي للطلاب محسوب لـ 15 اسبوعاً			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	33	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعياً	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	17	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعياً	1

Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	50
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Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	6	10% (10)	2,3,6,8,10 and 12	LO #3, #4 and #6, #7
	Projects / Lab.		10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	Midterm Exam	2hr:	10% (10)	8	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	علامات الترقيم والتنقيط والنواسخ
Week 2	المشتقات
Week 3	الجملة الاسمية
Week 4	الجملة الفعلية
Week 5	الفرق بين الضاد والطاء
Week 6	التاء المربوطة والتاء المفتوحة
Week 7	الهمزة وانواعها
Week 8	Mid Exam

Week 9	الجمع العدد
Week 10	العلامات الاصلية والعلامات الفرعية
Week 11	اعلام عراقيون بدر شاكر السياب والجواهري
Week 12	العطف
Week 13	حروف الجر
Week 14	الاسم المؤنث والاسم المذكر
Week 15	الحذف والزيادة
Week 16	الأسماء المنصوبة

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	جامع الدروس العربية وشرح ابن عقيل	Yes
Recommended Texts	Electromagnetic theory (book). 2000.vol.1	yes
Websites	https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering	

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	A – Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C – Good	جيد	70 - 79	Sound work with notable errors
	D – Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E – Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (تقيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.



Ministry of Higher Education and
Scientific Research - Iraq
University of Baghdad
College of Sciences
Department of Geology



جامعة بغداد / كلية العلوم

قسم علم الارض

مواد المرحلة الثالثة

الفصل الدراسي الاول

و

الفصل الدراسي الثاني

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Micropaleontology		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	Geo-35018		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	3	Semester of Delivery	5
Administering Department	Geology	College	Sciences
Module Leader	Dr. Anwar Kadhim	e-mail	anwar.mousa@sc.uobaghdad.edu.iq
Module Leader's Acad. Title	Assist. prof.	Module Leader's Qualification	Ph.D.
Module Tutor	Prof . Luay Sameer	e-mail	Luay.shakir@sc.uobaghdad.edu.iq
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/09/2025	Version Number	

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module		Semester	
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	To give the student an idea about the diagnostic details of fossils that could not be studied without a microscope, in addition to their stratigraphical and paleoecological importance in the geological studies.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	5. Teaching and learning methods 6. - Introductory lectures to give students a comprehensive view of the prescribed material 7. Covering the theoretical side by giving lectures or using modern techniques in presenting courses 8. The use of microscopes and stereoscopes as means of teaching and clarification 9. Assigning students to solve assignments in specific topics and then discuss them during the lesson to show the extent of familiarity with the knowledge gained and until he is able to scientific research 10. - Assigning students to visit the library and websites to obtain academic knowledge of various geological sciences
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. 1 - Extracting information for each course from several sources represented by methodological books, field trips, scientific references, the Internet, in addition to benefiting from the experiences of professors during and even after the end of lectures through professors' office hours 2 – Developing the intellectual skills of students by bringing real applied geological problems to the laboratory and urging students how to think applied in solving them and simulating them practically

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Introductory lectures to give students a comprehensive overview of the subject matter 2- Covering the theoretical aspect by giving lectures or using modern technologies in presenting academic courses 3- Using microscopes and stereoscopes as means of teaching and clarification
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	4- Assigning students to solve assignments on specific topics and then discussing them during the lesson to demonstrate the extent of their familiarity with the acquired knowledge and so that they become capable of scientific research. 5- Assigning students to visit the library and websites to obtain academic knowledge of various geological sciences
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	46	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignment	1	10% (10)	9	LO # 3, 4, 6 and 8
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	8	LO # 1-7
	Final Exam	3hr	50% (50)	16	All

Total assessment	100% (100 Marks)		
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Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Collecting and studying Microfossils
Week 2	Foraminifera: Introduction
Week 3	Wall Structure, Chamber shape
Week 4	chamber arrangement Apertures and openings, Pores,
Week 5	Foraminifera ecology
Week 6	larger Foraminifera, Family fusulinidae
Week 7	larger Foraminifera, family Nummulitidae
Week 8	Midterm Exam
Week 9	Ostracoda: Introduction
Week 10	Ostracoda: Shape
Week 11	Ostracoda: Muscle scars
Week 12	Ostracoda: pores
Week 13	Ostracoda: Hingement
Week 14	Ostracoda: orientation
Week 15	Ecology, and Adaptive morphology
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab1: Introduction about Foraminifera
Week 2	Lab2 : identification of Wall Structure, Chamber shape and chamber arrangement and Practical application of how to distinguish Wall Structure, Chamber shape and chamber arrangement of different species of foraminifera
Week 3	Lab3: identification Apertures and openings, and Pores. Practical application of how to distinguish apertures and openings, and Pores of different species of foraminifera
Week 4	Lab4: identification Ornamentation and suture line in Foraminifera and Practical application of how to distinguish Ornamentation and suture line in foraminifera
Week 5	Lab5: Introduction about larger Foraminifera and Practical application of how distinguish different type of section
Week 6	Lab6: : Practical application of how to distinguish Families Orbitoididae, , family Discocyclinidae, and family Miogypsinidae
Week 7	Lab7 : Practical application of how to distinguish Family fusulinidae , family Nummulitidae, , family miliolididae
Week 8	Lab8: mid Exam
Week 9	Lab9 : Ostracoda: Introduction Outer lamella, Shape, outline
Week 10	Lab10: Ostracoda - Studying Muscle scars and distinguishing between different types of Muscle scars in practical application
Week 11	Lab11: Studying Hingement of Ostrocod shell and distinguishing between different types Hingement in practical application
Week 12	Lab12 : Studying ornamentation and distinguishing between different types in practical application
Week 13	Lab13 : Practical application of how to orientation the Ostrocod shell

Week 14	Lab14 : Practical application of how to distinguish between the left and right valve of ostrocod shell
Week 15	Lab15 : Ecology, and Adaptive morphology
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Raup, D. and Stanley, S.; 1971; Principles of Paleontology Brenchley, P. and Harper, D.; 2004; Palaeoecology	Yes
Recommended Texts	Moore, R.C. (ed.); 1961; Treatise on Invertebrate Paleontology, Pt.Q, Arthropoda .Van Morkhoven, P.; 1962; Post-Paleozoic ostracoda, Vol. 1- Haq, B. and Boersma, A.; 1998; Introduction to Marine - .Micropaleontology, 2nd ed .Armstrong, H. and Brasier, M.; 2005; Microfossils, 2nd ed-	
Websites	https://education.nationalgeographic.org/resource/paleontology/	

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded

(0 – 49)	F – Fail	راسب	(0-44)	Considerable amount of work required
Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Igneous petrology		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	GEO-35019		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	3	Semester of Delivery	5
Administering Department	Geology	College	Sciences
Module Leader	Dr. Harith Ismaeel Mustaf Aljubury	e-mail	harith.aljubury@sc.uobaghdad.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor	Dr. Safaa Adeeb	e-mail	safaa.a@sc.uobaghdad.edu.iq
Peer Reviewer Name	Neaam Omar Farhan	e-mail	neaam.o@sc.uobaghdad.edu.iq
Scientific Committee Approval Date	01/09/2025	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Igneous petrology	Semester	5
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	

Module Aims أهداف المادة الدراسية	- Contributing to scientific progress, raising the level of education, and providing the labor market with graduates capable of working in all areas of the country's investment. - Training students on how to take field samples, process them in the laboratory, and transform them into applied products used in mineral exploration. - Training students on identifying the minerals that make up rocks, as these minerals provide details about the chemical, mineralogical, and textural composition of rocks and the conditions under which they formed.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	- Acquire the ability and skill to conduct field diagnostics. - Acquire the skill to distinguish between different types of igneous rocks. - Acquire the skill to distinguish between the types of minerals that make up different igneous rocks. - Use the principle of the present as the key to the past.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. We have introduced you to the basic principles of Igneous petrology. Let us now summarize what you have learned in this unit; - Igneous petrology is a branch of Geology which It deals with the types and time of formation of igneous rocks. - It studies the types of igneous rocks according to their mineral composition and the different conditions affecting them during the crystallization and formation process. - Study of igneous rock types in terms of their degree of silicate saturation and the amount of ferromagnesium minerals. - Study of the sources and types of magma that make up igneous rocks, through which the origin of the magma that makes up the rock and the tectonic environment in which the igneous rock was formed can be known. - Studying the types and textures of igneous rocks and the reasons for their formation, through which the tectonic environment that formed the rock can be identified. - Studying the mineral composition and determining the percentages of the main minerals that make up the rock, which in turn enables the student to classify the rock, identify its type and the type of magma that formed it.

Learning and Teaching Strategies

Strategies	When learning and teaching petrology, especially igneous rocks, it is important to use a variety of strategies to suit different learning styles and enhance understanding and retention. Here are some effective learning and teaching strategies in petrology: 1. Fieldwork and Practical Experience: Fieldwork is an essential component of petrology in general and igneous rocks in particular. Engaging students in field trips or field exercises enables them to observe and analyze rock outcrops, interpret rock structures, and collect samples. Practical experience enables students to develop observational skills, connect theoretical concepts to real-life examples, and enhance their understanding of petrology principles. 2. Visual aids: Use visual aids, such as studying rock models and pictures, to help students visualize and understand the forms of igneous rocks. Use pictures of rock then section models to illustrate the different forms and types of igneous rocks and indicate the type of texture. 3. Virtual Resources: Take advantage of virtual resources, such as interactive online modules, virtual field trips, and digital simulations. These resources provide students with immersive experiences, enabling them to virtually explore the principles of igneous rocks, their formation mechanisms, and study the geological and tectonic conditions that affect them. 4. Case Studies and Real-Life Examples: Present case studies and real-life examples that illustrate the forms and types of igneous rocks in various contexts, such as studying rock slices that show the distribution of minerals in the rock, distinguishing the type and texture of the igneous rock, identifying the type of tectonic environment, discovering the ancient conditions that produced the igneous rocks, and identifying the ancient environment in which the rock was formed. These examples help students understand the practical significance of igneous petrology and its relevance to various disciplines. 5. Laboratory Work: Conduct laboratory exercises that include describing and interpreting igneous rock samples, including identifying their petrological characteristics, mineral composition, and rock texture, identifying the source magma, and establishing the type and intensity of metamorphism. This enhances critical thinking and practical application of igneous rock concepts. 6. Continuous Assessment and Feedback: Implement regular assessments, such as quizzes, assignments, or class discussions, to gauge student understanding and provide timely feedback. This allows students to monitor their progress, identify areas of improvement, and reinforces learning. 7. Integrating Technology: Using rock analysis software and simulation tools to understand the mechanisms of magma crystallization, the differences between igneous rocks according to their type, and other technological resources to enhance the learning experience. These tools facilitate the diagnosis, visualization, and interpretation of igneous rocks, providing students with valuable skills applicable to the field of igneous petrology.
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	By using these learning and teaching strategies, teachers can create engaging and effective learning experiences in igneous petrology, cater to different learning styles, and promote a deep understanding of the subject.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	46	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 8
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	8	LO # 1-7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
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Week 1	Introduction
Week 2	Classification of Igneous Rocks
Week 3	Classification of Acidic and Intermediate Igneous Rocks
Week 4	Classification of Mafic and Ultramafic Igneous Rocks
Week 5	Classification of Volcanic and Hypabyssal Rocks
Week 6	Textures of Igneous Rocks
Week 7	Textures of Igneous Rocks
Week 8	Mid-Semester Exam
Week 9	Structures in Pyroclastic Deposits
Week 10	The Phase Rule (Binary Systems with a Eutectic)
Week 11	The Phase Rule (Binary Systems with a Thermal Barrier)
Week 12	The Phase Rule (Binary Systems with Solid Solution)
Week 13	The Phase Rule (Binary Systems with Partial Solid Solution)
Week 14	The Phase Rule (Phase Diagrams of Ternary Systems)
Week 15	Plate Tectonic and Magma Genesis
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Mineral Composition [Essential Minerals, Accessories Minerals, Secondary Minerals]
Week 2	Lab 2: Classification of Rock [Acidic, Intermediate]
Week 3	Lab 3: Classification of Rock [Mafic]
Week 4	Lab 4: Classification of Rock [Ultramafic]

Week 5	Lab 5: Rock Name and Equivalent Rock
Week 6	Lab 6: Texture [Degree of Crystalinty, Granularity and Shape of Crystals]
Week 7	Lab 7: Texture [Degree of Crystalinty, Granularity and Shape of Crystals]
Week 8	Lab 8: Texture [Degree of Crystalinty, Granularity and Shape of Crystals]
Week 9	Lab 9: Mid-Semester Exam
Week 10	Lab 10: Relation Ship Between Crystals and Crystals with Glass
Week 11	Lab 11: Acidity and Saturation by Silica
Week 12	Lab 12: Occurrence
Week 13	Lab 13: Detailed study of all rock thin section
Week 14	Lab 14: Detailed study of all rock thin section
Week 15	Lab 15: Complete review of the practical course

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1. Essentials of Igneous and Metamorphic Petrology 2. Principles of Igneous and Metamorphic Petrology Second Edition. 3. THE PETROLOGY OF THE IGNEOUS ROCKS.	Yes
Recommended Texts		No
Websites		

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Geotectonics		Module Delivery
Module Type	C		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	Geo-35020		
ECTS Credits	5		
SWL (hr./sem)	125		
Module Level		3	
Administering Department		Geology	College
Module Leader		Dr. Mahmood A. Salman	e-mail
Module Leader's Acad. Title		Assistant Professor	Module Leader's Qualification
Module Tutor		Assist. Prof. Thair Thamer	e-mail
Peer Reviewer Name		Prof. Dr. Salam Ismael Marhoon	e-mail
Scientific Committee Approval Date		01/09/2025	Version Number
			3.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Geotectonic	Semester	5
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1- Basic knowledge in the principles of geotectonic 2- Identify the basic concepts and perceptions of the magnificence of earth science 3- Introduction to the applied aspects, some basic concepts and their relationship to the formation of various structural phenomena, surface and subsurface. 4- Explaining all the theories that explained the origin of all superficial phenomena and superficial erosion of the structure and its types in the Earth. 5- Understanding the relationship of earth science and its connection to geotectonic and other branches of science.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Recognize the ongoing development of, evidence for, and large scale planetary effects of the Theory of Plate Tectonics. Describe Continental Drift including supporting evidence, convection current theory, sea floor spreading theory, paleomagnetism theory and plate tectonic theory. Critique and interpret major types of evidence supporting the Theory of Plate Tectonics. Describe different geological processes in relation to plate tectonics.
Indicative Contents المحتويات الإرشادية	1-overlain by one or two types of crustal material: oceanic crust (in older texts called sima from silicon and magnesium) and continental crust (sial from silicon and aluminium). 2-Crustal deformation. 3-Tectonics: rheology and thermal structure of the lithosphere. 4-Collision zones and thrust belts. 5-Rift systems and extensional fault systems. 6-Strike-slip faults and terrane tectonics

Learning and Teaching Strategies	
Strategies	Teaching and learning rely on a variety of methods and techniques that aim to effectively achieve the educational goals of geotectonic, including: 1. Learning: Encouraging active participation in the field of learning through group discussions, asking questions, and making reports on the most important geotectonic phenomena. 2. Cooperative learning: Encouraging work as a team to conduct research and Scientific reports 3. Self-learning: Empowering students to be responsible for their learning 4. Process by providing the resources and tools necessary for self-learning and motivating them to use them effectively. 5. Investigative learning: Encouraging students to actively explore topics and 6. Concepts through inquiry, self-research, and information gathering, which enhances scientific thinking skills. 7. . Promote interaction: Encourage students to actively participate in the lesson through asking questions and discussions 8. Employing these strategies appropriately can contribute to enhancing the learning experience and achieving maximum benefit for students in various educational contexts.

Student Workload (SWL)			
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem)		Structured SWL (h/w)	
الحمل الدراسي المنتظم للطالب خلال الفصل	79	الحمل الدراسي المنتظم للطالب أسبوعيا	53
Unstructured SWL (h/sem)		Unstructured SWL (h/w)	
الحمل الدراسي غير المنتظم للطالب خلال الفصل	46	الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (h/sem)			
الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 8
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 9 and 10
Summative assessment	Midterm Exam	2 hr.	10% (10)	8	LO # 1-7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	•Introducing to the geotectonic
Week 2	The dynamics of the earth
Week 3	Introduction to theories of continental formation
Week 4	The continental drift theory
Week 5	Convection current theory
Week 6	Sea floor spreading theory
Week 7	Paleomagnetism theory

Week 8	Midterm Exam
Week 9	. The magnetic of the earth and the pole of the earth
Week 10	The reversal of paleomagnetism
Week 11	Introduction of plate tectonic
Week 12	The zones of the earth
Week 13	The boundaries of Plate tectonic
Week 14	The earth quake and Arabian plate tectonics
Week 15	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1 Descriptive geometry
Week 2	Lab 2: find true dip from strike and apparent dip
Week 3	Lab 3 find strike and true dip from two apparent dip
Week 4	Lab 4:find strike and true dip from three points method
Week 5	Lab 5 :determination of thickness and depth of strata
Week 6	Lab 6:slop surface
Week 7	Lab 7: line of intersection Bearing ,plunge and pitch angle
Week 8	Lab 8 :Mid term
Week 9	Lab 9: The stereographic projection
Week 10	Lab 10: Draw stereographic of the following structural plane
Week 11	Lab 11: inclined bed when strike and dip
Week 12	Lab 12: vertical and horizontal bed when strike and dip
Week 13	Lab 13: determination of true dip and strike from two apparent dip
Week 14	Lab 14: determination of apparent dip from strike and true dip

Week 15	Lab 15: preparatory week
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Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	1-INTRODUCTION TO GEOTECTONICS by Ramakrishna Maiti (Author) 2023	Yes
Recommended Texts	INTRODUCTION TO GEOTECTONICS by Ramakrishna Maiti (Author) 2023	No
Websites		

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 - 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	GEOPHYSICS I (GRAVITY AND MAGNETIC METHODS)		Module Delivery	
Module Type	CORE		☒ Theory ☒ Lecture ☐ Tutorial ☒ Practical ☐ Seminar	
Module Code	GEO- 35021			
ECTS Credits	5			
SWL (hr/sem)	125			
Module Level	3	Semester of Delivery	5	
Administering Department	Type Dept. Code	College	Type College Code	
Module Leader	Dr. Osamah Saad & Dr. Lamees Nazar		e-mail	Osamah.sahib@sc.uobaghdad.edu.iq Lamees.abdulkareem@sc.uobaghdad.edu.iq
Module Leader's Acad. Title	Lecturers	Module Leader's Qualification	Ph.D.	
Module Tutor	Assist. Lect. Laith Sabah		e-mail	Lamees.abdulkareem@sc.uobaghdad.edu.iq
Peer Reviewer Name	Prof. Ali Maki	e-mail		
Scientific Committee Approval	01/09/2025	Version Number	1.0	

Relation With Other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	GEO-3522	Semester	5

Co-requisites module	None	Semester	
Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية			
Module Aims أهداف المادة الدراسية	• Overview of Geophysics in general and the basic physical concept of common individual Geophysical method and main applications of each interested exploration method. • Contribute to the process of scientific progress, raise the level of education, and provide the labor market with graduates to work in all earth-sciences fields of the country's oil, Archaeology, Hydrogeology, mineral and environmental investments. • Preparing the student to the basic principles of the Gravity and Magnetic geophysical methods and to be able to recognize the physical property (i.e., Earth physics parameter) of each method. • Training students on how to take field data/models and convert them into applied field sections/images products used in making subsurface geophysical maps.		
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Acquiring the ability and skill in geophysical field interpretation and elicitation. 2. Explain the Geophysics specializations in general. 3. Define the physical property for each common Geophysical method. 4. Explain the basic principles of the Seismic and electric geophysical methods. 5. Identify the main application for each exploration seismic and electric method. 6. Discuss some real case studies of Seismic and Electric method. In Geophysical explorations.		
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. We have introduced you to the basic principles of Applied Geophysics. Let us now summarize what you have learned in this unit; 1. Geophysics is a branch of Geology which deals with the physical properties of rocks/materials in relation to the background environments, and main geophysical exploration methods. [15 hrs] 2. It focuses primarily on physical property variation of rocks that include sedimentary rocks. It also includes geophysical study of metamorphic and other igneous subsurface rocks. [15 hrs] 3. The principles on which the Gravity studies are based include basic theory, Newton's universal gravitational law, and Newton's law of motion [15 hrs]. 4. Application of Gravity Surveying in Earth Sciences explorations [15 hrs].		

	5. Geoid surface and Variation of gravity with latitude, Variations of various rock-types densities and Geological factors affecting density [15 hrs]. 6- Gravity measurements and Gravity-meters Lab and Field Instruments, Modes (Types) of Gravity Surveys: the use of efficient/proper field exploration method to extract the potential physical information of the subsurface rocks and materials [15 hrs]. 7- Corrections to gravity Data/observations and Interpretation of Gravity data observations [15 hrs]. 9- Introduction of Magnetic Geophysical Method: Historical Background and Theory [15 hrs]. 9- Application of Magnetic surveying method [15 hrs]. 10- Components of Earth Geomagnetic Field [15 hrs].
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	When it comes to learning and teaching Geophysics, it is important to employ various strategies that cater to different learning styles and maximize understanding and retention. Here are some effective learning and teaching strategies for applied Geophysics: 1. Fieldwork and Hands-on Experience: Fieldwork is an essential component of Geophysics. Engage students in field trips or field-based exercises where they can observe, measure and analyze subsurface rock, interpret sedimentary subsurface structures, and provide proper results. Hands-on experience allows students to develop observational and field measurements skills, make connections between theoretical concepts and real-world examples, and enhance their understanding of Geophysical principles. 2. Visual Aids: Utilize visual aids, such as diagrams, charts, maps, and photographs, to help students visualize and comprehend Geophysical concepts. Use geological/ Geophysical maps to demonstrate the distribution and relationships between different rock units and incorporate stratigraphic columns to illustrate the vertical succession of strata. 3. Virtual Resources: Take advantage of virtual resources, such as interactive online modules, virtual field case studies, and digital simulations. These resources can provide students with immersive experiences, allowing them to explore Geophysical principles and study geological features virtually. 4. Case Studies and Real-life Examples: Present case studies and real-life examples that illustrate the application of Geophysics in various contexts, such as oil and gas exploration, seismology, hydrogeological or geological hazard assessments. These examples can help students understand the practical significance of Geophysics and its relevance with other different disciplines.

	5. Laboratory Work: Conduct laboratory exercises that involve the description, potential data corrections and interpretation of field data of 1D and 2D surveys, including the identification of lithology, sedimentary structures, and fluid content. Encourage students to create Gravity and magnetic curves or maps based on the laboratory data, promoting critical thinking and hands-on application of Geophysics concepts. 6. Collaborative Learning: Foster collaborative learning environments where students can work in groups or pairs to solve problems, analyze data, or interpret Geophysics information. This approach encourages active engagement, promotes discussions, and allows students to learn from one another's perspectives and insights. 7. Multimedia Resources: Incorporate multimedia resources, such as videos, animations, and online lectures, to supplement traditional teaching methods. Multimedia resources can help reinforce key concepts, illustrate Geophysical processes, and provide additional visual and auditory learning opportunities. 8. Concept Mapping: Encourage students to create concept maps or diagrams that depict the relationships between different Geophysical concepts, principles, and processes. Concept mapping enhances critical thinking, promotes knowledge organization, and facilitates the identification of connections between different Earth-physics components. 2. Continuous Assessment and Feedback: Implement regular assessments, such as quizzes, assignments, or class discussions, to gauge student understanding and provide timely feedback. This allows students to monitor their progress, identify areas of improvement, and reinforces their learning. 3. Integration of Technology: Utilize geophysical software, geophysical modeling tools, and other technology-based resources to enhance the learning experience. These tools can facilitate data analysis, visualization, and interpretation, providing students with valuable skills applicable to the field of applied Geophysics. By employing these learning and teaching strategies, educators can create engaging and effective learning experiences in Geophysics, catering to different learning styles, and promoting a deeper understanding of the subject matter.
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Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	46	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Attending lectures	1	10% (10)	all	continue
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr.	10% (10)	7	LO # 1-7
	Final Exam	3 hr.	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري مادة منهجية البحث

	Material Covered: Geophysics 1 (Gravity and Magnetic methods)
Week 1	Introduction: General overview of Geophysical exploration methods
Week 2	The principles on which the Gravity studies are based include basic theory, Newton's gravitational laws, Newton's law of motion.
Week 3	Application of Gravity Surveying in Earth Sciences explorations
Week 4	Geoid surface and Variation of gravity with latitude
Week 5	Variations of various rock-types densities and Geological factors affecting density
Week 6	Gravity measurements and Gravity-meters Lab and Field Instruments
Week 7	Mid-term-Exam
Week 8	Modes (Types) of Gravity Surveys: the use of efficient/proper field exploration method to extract the potential physical information of the subsurface rocks and materials
Week 9	Corrections to gravity Data/observations
Week 10	Interpretation of Gravity data observations
Week 11	Introduction of Magnetic Geophysical Method: Historical Background and Theory
Week 12	Application of Magnetic surveying method
Week 13	Components of Earth Geomagnetic Field [15 hrs].

Week 14	General review and discussion
Week 15	Mid-term- Second Exam
Week 16	Preparatory Week before Final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Principles of gravity method
Week 2	Lab 2: Explanation of survey modes and data processing: Corrections of gravity data
Week 3	Lab 3: Diurnal correction explanation of Gravity Raw field data
Week 4	Lab 4: Application of diurnal correction
Week 5	Lab 5: Second correction: Elevation correction
Week 6	Lab 6: Latitude gravity field correction
Week 7	Lab 7: Mid-Term-Seismic method Exam
Week 8	Lab 8: Calculate total Bouguer gravity data
Week 9	Lab 9: Interpretation of gravity data
Week 10	Lab 10: Regional-residual separation (Graphical method)
Week 11	Lab 11: Analytical method of data separation
Week 12	Lab 12: Introduction to Magnetic method
Week 13	Lab 13: Parameter explanation of the Earth Geomagnetic Field
Week 14	Lab 14: Calculation of Geomagnetic Field Parameters
Week 15	Final-Term- Magnetic method Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	1- <i>Fundamentals of Geophysics</i> , William Lowrie 2007, 2 nd Ed., Cambridge University Press.	No

	2- <i>An Introduction to Applied and Environmental Geophysics</i> , Reynolds 2011, 2 nd Ed., Wiley-Blackwell	
Recommended Texts	1- <i>Applied Geophysics</i> , Telford, Geldhart, Sheriff and Keys, Cambridge University Press.	No
Websites	https://geologyscience.com/geology-branches/geophysical-methods/	

GRADING SCHEME مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				
NB Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Stratigraphy		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	GEO-35022		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	3	Semester of Delivery	5
Administering Department	Geology	College	Science
Module Leader	Aiad Ali Hussien Al-Zaidy	e-mail	AIAD.hussien@sc.uobaghdad.edu.iq
Module Leader's Acad. Title	Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Shatha Fathi	e-mail	shatha.hassan@sc.uobaghdad.edu.iq
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/09/2025	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Stratigraphy	Semester	5
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	10. Contribute to the process of scientific progress, raise the level of education, and provide the labor market with graduates to work in all fields of the country's oil, mineral and environmental investment. 11. Training students on how to take field models and convert them into applied products used in making geological maps. 12. Training the student on the most important methods of determining the history or age of earth layers and the fossils they bear, and the relationship of the layers to each other and the relationship of the plants and animals that lived in them. This science also studies layers that do not contain fossils, where their origin is volcanic (such as lava flows and volcanic dust). It is not surprising that the science of describing the layers of the earth is divided into different branches, and depends on all of them in geological dating, and determining the exact age of rocks, and thus enabling us to know Description of the succession of ages that passed on the earth, and the development of plants and animals.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	15. Acquiring the ability and skill in field interpretation and elicitation. 16. Acquiring the skill of distinguishing between different geological features. 17. Dealing with the basic laws of various earth sciences. 18. Using the principle of the past as a key to the present in reconstructing the geological history of the earth's formation and development.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. We have introduced you to the basic principles of stratigraphy. Let us now summarize what you have learned in this unit;

- | | |
|--|---|
| | <ol style="list-style-type: none"> 1. Stratigraphy is a branch of Geology which deals with the sequence of rocks in relation to the time of their deposition. 2. It focuses primarily on stratified rocks that include sedimentary rocks and lava flows. It also includes study of metamorphic and other igneous rocks in relation to the time of their formation [15 hrs] 3. The principles on which the stratigraphic studies are based include order of superposition, original horizontality, lateral continuity, cross-cutting relationships, inclusions, unconformities, fossil succession, uniformitarianism, and catastrophism[15 hrs]. 4. Stratified rocks that are continuous vertically as well as laterally have normal contacts. However, there may be breaks in deposition that constitute an unconformable contact. Likewise, the contact may be faulted, or an igneous rock may produce an intrusive contact[15 hrs]. 19. The breaks in deposition or unconformities can be of various types like angular unconformity, non-conformity, disconformity, paraconformity or diastem. 20. Stratigraphic studies can be undertaken with simple equipment by taking traverses, recording attitudes, measuring sections, collecting fossils and preparing a stratigraphic column[15 hrs]. 21. Stratigraphy helps in unravelling the history of the Earth and organisms through time and helps in location and exploration of minerals, notably fossil fuels. 22. Time in stratigraphy is divided into eons, eras, periods epochs and ages based on important events notably in the evolution of organisms as seen from the fossil record. Thus, a standard scale is prepared that is being periodically modified. We can also determine the absolute age of some rocks by radiometric methods[15 hrs]. |
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	When it comes to learning and teaching stratigraphy, it is important to employ various strategies that cater to different learning styles and maximize understanding and retention. Here are some effective learning and teaching strategies for stratigraphy: 1. Fieldwork and Hands-on Experience: Fieldwork is an essential component of stratigraphy. Engage students in field trips or field-based exercises where they can observe and analyze rock outcrops, interpret sedimentary structures, and collect samples. Hands-on experience allows students to develop observational skills, make connections between theoretical concepts and real-world examples, and enhance their understanding of stratigraphic principles. 2. Visual Aids: Utilize visual aids, such as diagrams, charts, maps, and photographs, to help students visualize and comprehend stratigraphic concepts. Use geological maps to demonstrate the distribution and relationships between different rock units and incorporate stratigraphic columns to illustrate the vertical succession of strata. 3. Virtual Resources: Take advantage of virtual resources, such as interactive online modules, virtual field trips, and digital simulations. These resources can provide students with immersive experiences, allowing them to explore stratigraphic principles and study geological features virtually. 4. Case Studies and Real-life Examples: Present case studies and real-life examples that illustrate the application of stratigraphic principles in various contexts, such as oil and gas exploration, paleoenvironmental reconstructions, or geological hazard assessments. These examples can help students understand the practical significance of stratigraphy and its relevance in different disciplines. 5. Laboratory Work: Conduct laboratory exercises that involve the description and interpretation of rock samples, including the identification of lithology, sedimentary structures, and fossil content. Encourage students to create stratigraphic logs or cross-sections based on the laboratory data, promoting critical thinking and hands-on application of stratigraphic concepts. 6. Collaborative Learning: Foster collaborative learning environments where students can work in groups or pairs to solve problems, analyze data, or interpret stratigraphic information. This approach encourages active engagement, promotes discussions, and allows students to learn from one another's perspectives and insights. 7. Multimedia Resources: Incorporate multimedia resources, such as videos, animations, and online lectures, to supplement traditional teaching methods. Multimedia resources can help reinforce key concepts, illustrate geological processes, and provide additional visual and auditory learning opportunities.
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	8. Concept Mapping: Encourage students to create concept maps or diagrams that depict the relationships between different stratigraphic concepts, principles, and processes. Concept mapping enhances critical thinking, promotes knowledge organization, and facilitates the identification of connections between different stratigraphic components. 23. Continuous Assessment and Feedback: Implement regular assessments, such as quizzes, assignments, or class discussions, to gauge student understanding and provide timely feedback. This allows students to monitor their progress, identify areas of improvement, and reinforces learning. 24. Integration of Technology: Utilize geospatial software, stratigraphic modeling tools, and other technology-based resources to enhance the learning experience. These tools can facilitate data analysis, visualization, and interpretation, providing students with valuable skills applicable to the field of stratigraphy. By employing these learning and teaching strategies, educators can create engaging and effective learning experiences in stratigraphy, catering to different learning styles, and promoting a deeper understanding of the subject matter.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	46	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 8
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	8	LO # 1-7
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction - Stratigraphy
Week 2	Basics of stratigraphic classification
Week 3	Lithostratigraphic Units, classify and describe
Week 4	Correlation of lithostratigraphic unit
Week 5	Biostratigraphic units, classify and describe
Week 6	Correlation of biostratigraphic units
Week 7	Chronologic and Chronostratigraphic units

Week 8	Midterm Exam
Week 9	Stratigraphic relationships
Week 10	Transgression and regression
Week 11	Tectono-stratigraphy activity
Week 12	Facies and microfacies analysis
Week 13	Geological maps and cross sections
Week 14	Depositional environments and Diagenesis
Week 15	Sequence stratigraphy and cyclo-stratigraphy
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Introduction to Principles of geological laws
Week 2	Lab 2: Relative Age from cross section I
Week 3	Lab 3: Relative Age from cross section II
Week 4	Lab 4: Relative Age from Geologic Map I
Week 5	Lab 5: Relative Age from Geologic Map II
Week 6	Lab 6: Stratigraphic correlation I
Week 7	Lab 7: Stratigraphic correlation II
Week 8	Lab 8: Using Fossils to Correlate Rocks and Interpret Age
Week 9	Lab 9: Graphic correlation (Biostratigraphic technique) I

Week 10	Lab 10: Graphic correlation (Biostratigraphic technique) II
Week 11	Lab 11: Transgression and Regression
Week 12	Lab 12: Facies and Lithostratigraphy Relationships
Week 13	Lab 13: Unconformity analysis I
Week 14	Lab 14: Unconformity analysis I
Week 15	Lab 15: Sequence stratigraphy

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1. North American Commission on Stratigraphic Nomenclature (NORTH AMERICAN STRATIGRAPHIC CODE) 2. Principles of sequence stratigraphy (Octavian Catuneanu)	Yes
Recommended Texts	مبادئ علم الطبقات فاروق صنع الله العمري	No
Websites	http://www.sepmstrata.org/page.aspx?pageid=229	

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings

	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Sedimentary Petrology		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☒ Practical ☐ Seminar
Module Code	GEO-35023		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	3	Semester of Delivery	5
Administering Department	Geology	College	Science
Module Leader	Dr. Hasan Kattoof Jasim	e-mail	Hasan.jasim@sc.uobaghdad.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor	Dr. Hadi Salim	e-mail	hadi.s@sc.uobaghdad.edu.iq
Peer Reviewer Name	/	e-mail	E-mail
Scientific Committee Approval Date	01/09/2025	Version Number	1.0

Module Aims, Learning Outcomes and Indicative Contents

اهداف المادة الدراسية ونتائج التعلم والمحتويات الارشادية

Module Aims اهداف المادة الدراسية	1. Sedimentology aims to identify the types of loose sediments, how they are formed, the way they are transported, and the places and environments in which they deposition. 2. Introducing the importance of sedimentology, which is the link between earth science and all natural, medical and engineering sciences, agricultural and pure sciences
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Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Training in identifying and diagnosing the types of sediments of sediment, chemical and organic 2. Training on the skills of dealing with different types of sediment and mastering how to study its physical and chemical properties 3. Mastering the most important applications needed by all engineering scientific disciplines and pure sciences that deal with sediment of all kinds and its industrial and engineering applications.
Indicative Contents المحتويات الإرشادية	1. Identifying the types of sediments, which are clearly seen during field work and reconnaissance field trips. 2. Sedimentology are among the most important branches of earth science and have important applications in many engineering and scientific fields 3. Iraq has a huge amount of sediments, so students must understand and understand how to deal with sediments, the way to deal with them in geological workshops and in the field , how to make slides for these sediments and rocks, and how to study them under a polarizing microscope
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Training on the skills of collecting samples for sediment from the field and how to deal with them in the laboratory and geological workshop . 2. Mastering the process of preparing samples for the various types of analyses that can be conducted on sediment and sedimentary rocks. 3. Thinking about the applications that can be made on sediments, which are considered one of the most important requirements of most applied research. 4. Sediments have many applications, in addition to their engineering and industrial importance, as there are many of them that are considered precious stones, as well as being the basic component of many geological museums and what is known as geological parks and geoparks.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	46	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 8
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	8	LO # 1-7
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Sedimentary Rocks
Week 2	General Classification of sedimentary Rocks
Week 3	Rock Forming minerals of Sedimentary Rocks
Week 4	Clastic Sedimentary Rocks
Week 5	Conglomerate and Breccia
Week 6	Sandstone
Week 7	Classification of Sandstone

Week 8	Diagenesis Processes of Clastic Sedimentary rocks
Week 9	Texture of Clastic Sedimentary rocks
Week 10	Chemical Sedimentary rocks
Week 11	Texture, Groups, Classification m Environments of Chemical sedimentary rocks
Week 12	Carbonate Sedimentary Rocks
Week 13	Classification of Carbonate Sedimentary rocks
Week 14	Diagenesis Processes of Carbonate Sedimentary Rocks
Week 15	Sedimentary Environment and facies of Carbonate Sedimentary rocks
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Introduction to Sedimentary Rocks
Week 2	Lab 2: Rock forming minerals of sedimentary rocks
Week 3	Lab 3: Conglomerate and Breccia , Texture , Mineralogy, and Diagenesis
Week 4	Lab 4: Classification of Conglomerate
Week 5	Lab 5: Sandstone
Week 6	Lab 6: Components of Sandstone
Week 7	Lab 7: Texture , Mineralogy, and Diagenesis of Sandstone
Week 8	Lab 8: Classification of Sandstone

Week 9	Lab 9: Chemical Sedimentary Rocks
Week 10	Lab 10: Mineralogy of Chemical Sedimentary Rocks (Evaporites)
Week 11	Lab11: Carbonate Sedimentary Rocks (Texture, Mineralogy, and Diagenesis)
Week 12	Lab 12: Classification of Carbonate Sedimentary Rocks
Week 13	Lab 13:Facies Analysis Of Carbonate Sedimentary Rocks
Week 14	Lab 14: Techniques for Mineralogical Identification (Staining , Etching)
Week 15	Lab 15: Final Practical Examination of Sedimentary Rocks

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Folk, 1974 and Pettijohn, 1975	Yes
Recommended Texts	Boggs, 1995, and 2001	Yes
Websites	https://www.cliffsnotes.com/study-guides/geology/sedimentary-rocks/clastic-sedimentary-rocks	

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria

Fail Group	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
(0 – 49)	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

	Ministry of Higher Education and Scientific Research - Iraq University of Baghdad College of Sciences Department of Geology	
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جامعة بغداد / كلية العلوم

قسم علم الارض

مواد المرحلة الثالثة

الفصل الدراسي الثاني

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Paleoecology		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	GEO-36124		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	3	Semester of Delivery	6
Administering Department	Geology	College	Science
Module Leader	Dr. Anwar Kadhim	e-mail	anwar.mousa@sc.uobaghdad.edu.iq
Module Leader's Acad. Title	Assist. Prof	Module Leader's Qualification	Ph.D.
Module Tutor	Prof. Luay Sameer	e-mail	luay.shakir@sc.uobaghdad.edu.iq
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/10/2025	Version Number	

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	GEO35018	Semester	3
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	13. This module teach the students the fundamentals of paleoecology 14. Training the student to understand the shapes, modes of preservation, classification, nomenclature of species and genera. 15. The course deals with marine paleoecology and its objective is to knowledge and understands how fossils can be applied for paleoenvironmental reconstruction at level of individual, population and community.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	25. Using palaeoecological data to interpret past environments and fossil data to evaluate evolutionary histories. 26. Learning the marine palaeoenvironments and the analysis of controlling variables such as water depth, palaeo-oxygenation, substrate type. 27. Learning the material of typical ecosystem and the relationships between them.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. 1. Introduction (definitions and subdivision of paleoecology; relationships between organisms fossils and paleoecology). 2. Basic concepts of ecology and the marine ecosystem (physical environments, life modes and trophic strategies of marine organisms). 3. Environmental control on organism distribution in the marine environments; 4. Fossils Distribution in environments and their relationships with functional morphology. 5. Fossils shape as environmental indicators in marine modules. 6. Paleoecologic reconstruction at population and community levels. 7. Quantitative analysis of fossils assemblages such as - Analysis of some fossils like foraminifera or ostracod assemblages indicative of different marine to reconstruction the paleoenvironments

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	1 - Extracting information for each course from several sources, such as methodological books, field trips, scientific references, and the Internet, in addition to benefiting from the professors' experiences during and even after the end of the lectures through the professors' office hours. 2 - Developing students' intellectual skills by bringing real applied geological problems to the laboratory and urging students how to think applied in solving them and simulating them practically.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	71	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignment	1	10% (10)	9	LO # 3, 4, 6 and 8
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	8	LO # 1-7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Preservation and the Fossil Record
Week 2	Ontogenetic Variation
Week 3	Taphonomy
Week 4	The population as a unit
Week 5	The species
Week 6	Evolution and the Fossil Record
Week 7	Models of evolution
Week 8	Midterm Exam

Week 9	Fundamental ecologic principles
Week 10	The marine ecosystem
Week 11	Life habits
Week 12	Limiting factors
Week 13	Spatial distribution of populations
Week 14	Organic reef communities
Week 15	Biogeography
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab1: Mode of depositional marine environment and the application of paleoecology in geological study
Week 2	Lab2 : Identification of Pale environment by using fossils
Week 3	Lab3: Classification of Pale environment units by utilizing fossils
Week 4	Lab4: Conclusion distance of reef beds from ancient shoreline by using different types of reefs
Week 5	Lab5: Evidence of animal activity, in conclusion, the Pale environment
Week 6	Lab6: Conclusion The Pale environment by using Pale ichnology
Week 7	Lab7 : The Paleoecology changed in Quaternary period by using pollen and spore
Week 8	Lab8 : Midterm Exam

Week 9	Lab9 : The type and shape of evolution and extinction
Week 10	Lab10: Applied the type of evolution by using the figures
Week 11	Lab11: Sketch the type of evolution and extinction in Lituolidae families
Week 12	Lab12 : Sketch the distribution of the evolution line in Lituolidae families
Week 13	Lab13 : Sketch the tree of evolution and extinction in graptolite
Week 14	Lab14 : Draw the evolution trend for graptolite
Week 15	Lab15 : Design the evolution tree by utilizing the age of fossils
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1. Brenchley, P. and Harper, D.; 2004; Palaeoecology. 2. Ager, D.; 1963; Principles of Paleocolgy.	Yes
Recommended Texts	Brenchley, P. and Harper, D.; 2006; Palaeoecology اساسيات البيئه القديمه . العامري . 1989.	No
Websites	https://www.amazon.com/Principles-Paleoecology-Introduction-Animals-Plants/dp/1258398850	

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
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MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Metamorphic petrology		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	GEO-36125		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	3	Semester of Delivery	6
Administering Department	Geology	College	Science
Module Leader	Dr. Harith Ismaeel Mustaf Aljubury	e-mail	harith.aljubury@sc.uobaghdad.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor	Dr. Safaa Adeeb	e-mail	safaa.a@sc.uobaghdad.edu.iq
Peer Reviewer Name	Neaam Omar Farhan	e-mail	neaam.o@sc.uobaghdad.edu.iq
Scientific Committee Approval Date	01/10/2025	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	GEO35019	Semester	3
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	16. Contributing to scientific progress, raising the level of education, and providing the labor market with graduates capable of working in all areas of the country's investment. 17. Training students on how to take field samples, process them in the laboratory, and transform them into applied products used in mineral exploration. 18. Training students on identifying the minerals that make up rocks, as these minerals provide details about the chemical, mineralogical, and textural composition of rocks and the conditions under which they formed.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	28. Acquire the ability and skill to conduct field diagnostics. 29. Acquire the skill to distinguish between different types of metamorphic rocks. 30. Acquire the skill to distinguish between the types of minerals that make up different metamorphic rocks. 31. Use the principle of the present as the key to the past.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. We have introduced you to the basic principles of Metamorphic petrology. Let us now summarize what you have learned in this unit; 7. Metamorphic petrology is a branch of Geology which It deals with the types and time of formation of metamorphic rocks. 8. It studies the types of metamorphism according to the different conditions affecting the original rocks, whether igneous, sedimentary or metamorphic. 9. Studying the types and forms of pressure affecting the original rocks, and the amount of deformation occurring in the rock and the constituent minerals. 10. Studying the sources affecting the change in temperature and original pressure in the interior of the earth. 11. Studying the types and shapes of the texture that make up metamorphic rocks and the reasons for their formation. 12. Studying the minerals that indicate the intensity and extent of metamorphism resulting from differences in conditions of heat and pressure within the earth.

	13. Studying the types of metamorphic facies according to different metamorphic conditions.
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	When learning and teaching petrology, especially metamorphic rocks, it is important to use a variety of strategies to suit different learning styles and enhance understanding and retention. Here are some effective learning and teaching strategies in petrology: 1. Fieldwork and Practical Experience: Fieldwork is an essential component of petrology in general and metamorphic rocks in particular. Engaging students in field trips or field exercises enables them to observe and analyze rock outcrops, interpret rock structures, and collect samples. Practical experience enables students to develop observational skills, connect theoretical concepts to real-life examples, and enhance their understanding of petrology principles. 2. Visual aids: Use visual aids, such as studying rock models and pictures, to help students visualize and understand the forms of metamorphic rocks. Use pictures of rock slide models to illustrate the different forms and types of metamorphic rocks and indicate the type of metamorphism that results from these rocks. 3. Virtual Resources: Take advantage of virtual resources, such as interactive online modules, virtual field trips, and digital simulations. These resources provide students with immersive experiences, enabling them to virtually explore the principles of metamorphic rocks, their formation mechanisms, and study the geological conditions that affect them. 4. Case Studies and Real-Life Examples: Present case studies and real-life examples that illustrate the forms and types of metamorphic rocks in various contexts, such as studying rock slices that show the distribution of minerals in the rock, distinguishing the type and texture of the metamorphic rock, identifying the type of metamorphism, discovering the ancient conditions that affected the parent rock, and identifying the ancient environment in which the rock was formed. These examples help students understand the practical significance of metamorphic petrology and its relevance to various disciplines. 5. Laboratory Work: Conduct laboratory exercises that include describing and interpreting metamorphic rock samples, including identifying their petrological characteristics, mineral composition, and rock texture, identifying the parent rock, and establishing the type and intensity of metamorphism. This enhances

	critical thinking and practical application of metamorphic and metamorphic rock concepts. 6. Continuous Assessment and Feedback: Implement regular assessments, such as quizzes, assignments, or class discussions, to gauge student understanding and provide timely feedback. This allows students to monitor their progress, identify areas of improvement, and reinforces learning. 7. Integrating Technology: Using rock analysis software and simulation tools to understand the mechanisms of metamorphism, the differences between metamorphic rocks according to their type, and the factors affecting the parent rock, such as pressure and temperature, and other technological resources to enhance the learning experience. These tools facilitate the diagnosis, visualization, and interpretation of metamorphic rocks, providing students with valuable skills applicable to the field of metamorphic petrology. By using these learning and teaching strategies, teachers can create engaging and effective learning experiences in metamorphic petrology, cater to different learning styles, and promote a deep understanding of the subject.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	71	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

	Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
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Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 8
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	8	LO # 1-7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction
Week 2	Types of Metamorphism and Metamorphic Conditions
Week 3	Causes of metamorphism
Week 4	Textures of Metamorphic Rocks
Week 5	Textures of Metamorphic Rocks
Week 6	Metamorphic Facies and Index Minerals
Week 7	Metamorphic Facies and Index Minerals
Week 8	Mid-Semester Exam
Week 9	Metamorphism of Acidic Rocks (Granite)

Week 10	Metamorphism of Mafic Rocks (Gabbro, Dunite and Harzburgite)
Week 11	Reactions in KFMASH
Week 12	Geo Thermo Barometry
Week 13	How to develop a thermobarometer
Week 14	Metamorphism of characteristic rock suites
Week 15	Metasomatism, change in composition
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Mineral Composition [Essential Minerals, Accessories Minerals, Secondary Minerals]
Week 2	Lab 2: Classification of Metamorphic Rock
Week 3	Lab 3: Classification of Metamorphic Rock
Week 4	Lab 4: Texture of Foliated Metamorphic Rocks
Week 5	Lab 5: Texture of Nonfoliated Metamorphic Rocks
Week 6	Lab 6: Type and Degree of Metamorphism
Week 7	Lab 7: Parent Rock
Week 8	Lab 8: Mid-Semester Exam
Week 9	Lab 9: Metamorphic Facies and Index Minerals
Week 10	Lab 10: Metamorphic Facies and Index Minerals
Week 11	Lab 11: Naming of metamorphic rocks

Week 12	Lab 12: Occurrence
Week 13	Lab 13: Detailed study of all rock thin section
Week 14	Lab 14: Detailed study of all rock thin section
Week 15	Lab 15: Complete review of the practical course

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	1. Principles of Metamorphic Petrology. 2. METAMORPHIC ROCKS AND THEIR GEODYNAMIC SIGNIFICANCE. 3. IGNEOUS AND METAMORPHIC PETROLOGY SECOND EDITION.	Yes
Recommended Texts		No
Websites		

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Field Geology		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	GEO-36026		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	3	Semester of Delivery	6
Administering Department	Geology	College	Sciences
Module Leader	Thair thamer iltayif al-samarrai	e-mail	Thair.t@sc.uobaghdad.edu.iq
Module Leader's Acad. Title	Assist. Prof	Module Leader's Qualification	Ph.D.
Module Tutor	Prof. Hamid Hassan	e-mail	hamid.h@sc.uobaghdad.edu.iq
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/10/2025	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Field geology	Semester	6
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	19. Understanding the basics of field geology and linking field geology as far as it relates to common topics, which is mainly represented by field observations of all geological phenomena (structural and geomorphological) 20. Knowing how to measure the orientation and inclination of the earth layers because it is considered very necessary for every geologist and is considered the basis for the field 21. Knowing the location fixation And draw the geological map and the geological section.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	32. Knowledge of the basics and principles of field geology 33. Knowledge of working with field tools and devices because they are very necessary, especially those related to the ground layers 34. It is very necessary to get acquainted with and practice all field work, from map orientation and locating sites in the field to measurements of the ground layers in the field and drawing the geological line and the geological section.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. We have introduced you to the basic principles of field geology. Let us now summarize what you have learned in this unit; 1. field geology is a branch of Geology which deals with the outcrops of rocks in the field. 2. It focuses primarily on uses the compasses. It also includes study of measurements all data in the field [15 hrs] 35. Develop skills related to field subjects by conducting all measurements and field checks 36. Develop understanding and linkage between field topics and other related topics

	37. It develops thought in the field and in all the small projects and in all disciplines [15 hrs]. 38. The breaks in deposition or unconformities can be of various types like angular unconformity, non-conformity, disconformity, paraconformity or diastem. 39. Field geology studies can be undertaken with simple equipment by taking traverses, recording attitudes, measuring sections, collecting fossils and preparing a stratigraphic column[15 hrs]. 40. Field geology helps in unravelling the history of the Earth and organisms through time and helps in location and exploration of minerals.
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	When it comes to learning and teaching field geology, it is important to employ various strategies that cater to different learning styles and maximize understanding and retention. Here are some effective learning and teaching strategies for stratigraphy: 1. Fieldwork and Hands-on Experience: Fieldwork is an essential component of stratigraphy. Engage students in field trips or field-based exercises where they can observe and analyze rock outcrops, interpret sedimentary structures, and collect samples. Hands-on experience allows students to develop observational skills, make connections between theoretical concepts and real-world examples, and enhance their understanding of stratigraphic principles. 2. Visual Aids: Utilize visual aids, such as diagrams, charts, maps, and photographs, to help students visualize. Use geological maps to demonstrate the distribution and relationships between different rock units and incorporate stratigraphic columns to illustrate the vertical succession of strata. 3. Virtual Resources: Take advantage of virtual resources, such as interactive online modules, virtual field trips, and digital simulations. These resources can provide students with immersive experiences, allowing them to explore stratigraphic principles and study geological features virtually. 4. Case Studies and Real-life Examples: Present case studies and real-life examples that illustrate the application of stratigraphic principles in various contexts, such
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	as oil and gas exploration, paleoenvironmental reconstructions, or geological hazard assessments. These examples can help students understand the practical significance of stratigraphy and its relevance in different disciplines. 5. Laboratory Work: Conduct laboratory exercises that involve the description and interpretation of rock samples, including the identification of lithology, sedimentary structures, and fossil content. Uses Brunton and Silva compasses. 6. Collaborative Learning: Foster collaborative learning environments where students can work in groups or pairs to solve problems, analyze data, or interpret stratigraphic information. This approach encourages active engagement, promotes discussions, and allows students to learn from one another's perspectives and insights. 7. Multimedia Resources: Incorporate multimedia resources, such as videos, animations, and online lectures, to supplement traditional teaching methods. Multimedia resources can help reinforce key concepts, illustrate geological processes, and provide additional visual and auditory learning opportunities. 8. Concept Mapping: Encourage students to create concept maps or diagrams that depict the relationships between different stratigraphic concepts, principles, and processes. Concept mapping enhances critical thinking, promotes knowledge organization, and facilitates the identification of connections between different stratigraphic components. 41. Continuous Assessment and Feedback: Implement regular assessments, such as quizzes, assignments, or class discussions, to gauge student understanding and provide timely feedback. This allows students to monitor their progress, identify areas of improvement, and reinforces learning. 42. Integration of Technology: Utilize geospatial software, stratigraphic modeling tools, and other technology-based resources to enhance the learning experience. These tools can facilitate data analysis, visualization, and interpretation, providing students with valuable skills applicable to the field geology.
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Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem)		Structured SWL (h/w)	
الحمل الدراسي المنتظم للطالب خلال الفصل	79	الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem)		Unstructured SWL (h/w)	
الحمل الدراسي غير المنتظم للطالب خلال الفصل	46	الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (h/sem)	125		

الحمل الدراسي الكلي للطالب خلال الفصل	
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Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 8
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	8	LO # 1-7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Principles of field geology and rock outcrop
Week 2	Field tools and field notes
Week 3	Collection of rock samples and fossils
Week 4	Methods of geological mapping and map orientation
Week 5	Geological mapping methods
Week 6	Brentton's compass and its uses Direction, inclination, and angles with a Brinton compass

Week 7	Midterm Exam
Week 8	Silva compass in its uses
Week 9	Direction, inclination and angles with silva compass
Week 10	Ebny level device
Week 11	Clinometer device
Week 12	geological tracks
Week 13	Drawing geological sections
Week 14	Sequences stratigraphy
Week 15	Methods for calculating real angles and thicknesses
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab1: Bearing: quadrant and azimuth
Week 2	Lab2: Reverse bearing
Week 3	Lab3: Point location by reverse bearing intersection with known linear feature
Week 4	Lab4: Point location by intersection of reverse bearing lines from index point
Week 5	Lab5: Point location by Bearing and pacing method in flat area
Week 6	Lab6: Point location by pacing method in uniformly inclined area
Week 7	Lab7: Point location by intersection of reverse bearing line with contour lines.
Week 8	Lab8: Brunton compass: parts of compass and setting

Week 9	Lab9: Brunton compass :uses of Brunton compass
Week 10	Lab10: Silva compass: parts of silva compass
Week 11	Lab11: Silva compass: uses of silva compass for bearing, dip & Strike, pitch angle
Week 12	Lab12: Abney level: parts and slope angle measurement
Week 13	Lab13: hand level: parts and uses.
Week 14	Lab14: Drawing Geological cross section
Week 15	Lab15: Drawing stratigraphic section

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Manual of Field Geology	Yes
Recommended Texts	Geological Field Techniques	yes
Websites		

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings

	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information					
معلومات المادة الدراسية					
Module Title	GEOPHYSICS 2 (SEISMIC AND ELECTRICAL METHODS)		Module Delivery		
Module Type	CORE		☒ Theory ☒ Lecture ☐ Tutorial ☐ Practical ☐ Seminar		
Module Code	GEO- 36027				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level		3	Semester of Delivery		6
Administering Department		Type Dept. Code	College	Type College Code	
Module Leader	Dr. Osamah Saad & Dr. Lamees Nazar		e-mail	Osamah.sahib@sc.uobaghdad.edu.iq Lamees.abdulkareem@sc.uobaghdad.edu.iq	
Module Leader's Acad. Title		Lecturers	Module Leader's Qualification		Ph.D.
Module Tutor	Assist. Lect. Ansam Hassan		e-mail	ansam.h@sc.uobaghdad.edu.iq	
Peer Reviewer Name		Prof. Ali Maki	e-mail		
Scientific Committee Approval		01/10/2025	Version Number	1.0	

Relation With Other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	GEO-3522	Semester	5
Co-requisites module	None	Semester	
Module Aims, Learning Outcomes and Indicative Contents			

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	• Overview of Geophysics in general and the basic physical concept of common individual Geophysical method and main applications of each interested exploration method. • Contribute to the process of scientific progress, raise the level of education, and provide the labor market with graduates to work in all earth-sciences fields of the country's oil, Archaeology, Hydrogeology, mineral and environmental investments. • Preparing the student to the basic principles of the Seismic and Electric geophysical methods and to be able to recognize the physical property (i.e., Earth physics parameter) of each method. • Training students on how to take field data/models and convert them into applied field sections/images products used in making subsurface geophysical maps.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	7. Acquiring the ability and skill in geophysical field interpretation and elicitation. 8. Explain the Geophysics specializations in general. 9. Define the physical property for each common Geophysical method. 10. Explain the basic principles of the Seismic and electric geophysical methods. 11. Identify the main application for each exploration seismic and electric method. 12. Discuss some real case studies of Seismic and Electric method. In Geophysical explorations.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. We have introduced you to the basic principles of Applied Geophysics. Let us now summarize what you have learned in this unit; 1. Geophysics is a branch of Geology which deals with the physical properties of rocks/materials in relation to the background environments. 2. It focuses primarily on physical property variation of rocks that include sedimentary rocks. It also includes geophysical study of metamorphic and other igneous subsurface rocks. [15 hrs] 3. The principles on which the seismic studies are based include basic theory, Snell's law, refraction principles of two-horizontal layers, three-horizontal layers and dipping layers [15 hrs]. 4. Principles of Reflection seismic method and the case studies of various subsurface layers (i.e., Horizontal and dipping layers) [15 hrs]. 2. Introduction to applied geophysical methods and their physical properties that

	depending on, then introduction to Electrical resistivity methods. 3. Application of Electrical resistivity method and the basic principles of electrical resistivity (Ohm's law) [15 hrs]. 4. Applied geophysics help in unravelling the main subsurface structures of the Earth, in order to locate and explore the minerals, notably oil-bearing layers and different economic and environmental investigations. 5. Use efficient/proper field exploration method to extract the potential physical information of the subsurface rocks and materials [15 hrs].
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	When it comes to learning and teaching Geophysics, it is important to employ various strategies that cater to different learning styles and maximize understanding and retention. Here are some effective learning and teaching strategies for applied Geophysics: 1. Fieldwork and Hands-on Experience: Fieldwork is an essential component of Geophysics. Engage students in field trips or field-based exercises where they can observe, measure and analyze subsurface rock, interpret sedimentary subsurface structures, and provide proper results. Hands-on experience allows students to develop observational and field measurements skills, make connections between theoretical concepts and real-world examples, and enhance their understanding of Geophysical principles. 2. Visual Aids: Utilize visual aids, such as diagrams, charts, maps, and photographs, to help students visualize and comprehend Geophysical concepts. Use geological/ Geophysical maps to demonstrate the distribution and relationships between different rock units and incorporate stratigraphic columns to illustrate the vertical succession of strata. 3. Virtual Resources: Take advantage of virtual resources, such as interactive online modules, virtual field case studies, and digital simulations. These resources can provide students with immersive experiences, allowing them to explore Geophysical principles and study geological features virtually. 4. Case Studies and Real-life Examples: Present case studies and real-life examples that illustrate the application of Geophysics in various contexts, such as oil and gas exploration, seismology, hydrogeological or geological hazard assessments. These examples can help students understand the practical significance of Geophysics and its relevance with other different disciplines. 5. Laboratory Work: Conduct laboratory exercises that involve the description and interpretation of field curves of 1D and 2D surveys, including the identification of lithology, sedimentary structures, and fluid content. Encourage students to create Geo-electric or cross-sections based on the laboratory data, promoting critical thinking and hands-on application of Geophysics concepts.

	6. Collaborative Learning: Foster collaborative learning environments where students can work in groups or pairs to solve problems, analyze data, or interpret Geophysics information. This approach encourages active engagement, promotes discussions, and allows students to learn from one another's perspectives and insights.
	7. Multimedia Resources: Incorporate multimedia resources, such as videos, animations, and online lectures, to supplement traditional teaching methods. Multimedia resources can help reinforce key concepts, illustrate Geophysical processes, and provide additional visual and auditory learning opportunities.
	8. Concept Mapping: Encourage students to create concept maps or diagrams that depict the relationships between different Geophysical concepts, principles, and processes. Concept mapping enhances critical thinking, promotes knowledge organization, and facilitates the identification of connections between different Earth-physics components.
	2. Continuous Assessment and Feedback: Implement regular assessments, such as quizzes, assignments, or class discussions, to gauge student understanding and provide timely feedback. This allows students to monitor their progress, identify areas of improvement, and reinforces their learning.
	3. Integration of Technology: Utilize geophysical software, geophysical modeling tools, and other technology-based resources to enhance the learning experience. These tools can facilitate data analysis, visualization, and interpretation, providing students with valuable skills applicable to the field of applied Geophysics.
	By employing these learning and teaching strategies, educators can create engaging and effective learning experiences in Geophysics, catering to different learning styles, and promoting a deeper understanding of the subject matter.

Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	71	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	4.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Attending lectures	1	10% (10)	all	continue
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr.	10% (10)	7	LO # 1-7
	Final Exam	3 hr.	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري مادة منهجية البحث

	Material Covered: Geophysics 2 (Seismic and Electrical method)
Week 1	Part 1: Seismic Methods: Introduction to Seismic methods, Application of seismic methods.
Week 2	Types of seismic waves, Important principles on seismic waves propagation,
Week 3	Theory of elasticity and types of elastic moduli, Factors affecting seismic wave velocity. Seismic exploration and field equipment & tools.
Week 4	Refraction method, Field survey arrangements, Interpretation of travel time data for two horizontal Layers case.
Week 5	Refraction method: Interpretation of travel time data for three horizontal Layers case and dipping layer.
Week 6	Reflection method: Reflection and Transmission of seismic waves in layers, Interpretation of travel time data for two horizontal Layers case and dipping layer
Week 7	Mid-term-Exam
Week 8	General overview of Geophysical exploration methods
Week 9	Overview of Electrical methods and fundamentals of Electrical resistivity method
Week 10	Array types of Electric resistivity method
Week 11	Resistivity of common Earth materials and Rock-types, Archie's law of sedimentary rocks
Week 12	Survey modes of Electrical resistivity method, 1D Survey techniques
Week 13	2D and 3D Survey techniques of Electrical resistivity method
Week 14	General review and discussion
Week 15	Mid-term- Second Exam

Week 16	Preparatory Week before Final Exam
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Delivery Plan (Weekly Lab. Syllabus) المناهج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: 1- Calculation of parts of seismic waves. 2- Applications on Snell's law
Week 2	Lab 2: Calculation the Elastic constants & seismic velocity
Week 3	Lab 3: Refraction method: Draw Time - distance curve
Week 4	Lab 4: Refraction method: Interpretation of Two horizontal layers
Week 5	Lab 5: Refraction method: Interpretation of Three horizontal layers & Dipping layer
Week 6	Lab 6: Reflection method: Time - distance curve. Calculating Acoustic impedance, Reflection coefficient & Transmission coefficient.
Week 7	Lab 7: Mid-Term-Seismic method Exam
Week 8	Lab 8: Ohm's law and Calculation of Apparent resistivity
Week 9	Lab 9: Quantitative interpretation of 1D VES curve
Week 10	Lab 10: Two-layers Field curve example of 1D VES resistivity curve
Week 11	Lab 11: Three-layers complete curve matching
Week 12	Lab 12: Second Field curve example of Three-layers complete curve matching
Week 13	Lab 13: Three-layers Partial curve matching
Week 14	Lab 14: Qualitative Interpretation of 2D resistivity field profile
Week 15	Mid-Term-Electric resistivity method Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	1- <i>Fundamentals of Geophysics</i> , William Lowrie 2007, 2 nd Ed., Cambridge University Press. 2- <i>An Introduction to Applied and Environmental Geophysics</i> , Reynolds 2011, 2 nd Ed., Wiley-Blackwell	No

Recommended Texts	1- <i>Applied Geophysics</i> , Telford, Geldhart, Sheriff and Keys, Cambridge University Press.	No
Websites	https://geologyscience.com/geology-branches/geophysical-methods/	

GRADING SCHEME مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				
NB Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Geology of Iraq		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	GEO-36028		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	3	Semester of Delivery	6
Administering Department	Geology	College	Sciences
Module Leader	AIAD Ali Hussien Al-Zaidy	e-mail	AIAD.hussien@sc.uobaghdad.edu.iq
Module Leader's Acad. Title	Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Shatha Fathi	e-mail	shatha.hassan@sc.uobaghdad.edu.iq
Peer Reviewer Name	Prof. Dr. Ahmed S. Al-Banna	e-mail	geobanna1955@yahoo.com
Scientific Committee Approval Date	01/10/2025	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module		Semester	
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims

أهداف المادة الدراسية

1. **Advancing Scientific Progress and National Development** Contribute to Iraq's scientific advancement by elevating the standards of geological education and research. Equip graduates with the knowledge and skills necessary to support the country's vital sectors—particularly oil, mineral resources, and environmental management—ensuring a competent workforce for sustainable national investment.
2. **Applied Field Training and Geological Mapping** Train students in the practical techniques of field sampling and model collection across Iraq's diverse geological terrains. Emphasize the transformation of raw field data into applied geological products, such as stratigraphic columns and detailed geological maps, which are essential for exploration and resource assessment.
3. **Stratigraphy, Paleontology, and Volcanic Geology** Provide comprehensive training in methods for determining the age and historical context of Iraq's sedimentary layers and the fossils they contain. Explore the interrelationships among stratigraphic units and the evolution of ancient ecosystems. Extend this understanding to non-fossiliferous volcanic formations—such as basaltic lava flows and pyroclastic deposits—highlighting their role in Iraq's geologic history. Emphasize the multidisciplinary nature of stratigraphy, integrating biostratigraphy, lithostratigraphy, and chronostratigraphy to accurately date rock formations. This enables a detailed reconstruction of Earth's geologic timeline and the evolutionary progression of flora and fauna within the region.

Module Learning Outcomes مخرجات التعلم للمادة الدراسية	43. Acquiring the ability and skill in field interpretation and elicitation. 44. Acquiring the skill of distinguishing between different geological features. 45. Dealing with the basic laws of various earth sciences. 46. Using the principle of the past as a key to the present in reconstructing the geological history of the earth's formation and development.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. We have introduced you to the basic principles of stratigraphy. Let us now summarize what you have learned in this unit; 1. Stratigraphy is a branch of Geology which deals with the sequence of rocks in relation to the time of their deposition. 2. It focuses primarily on stratified rocks that include sedimentary rocks and lava flows. It also includes study of metamorphic and other igneous rocks in relation to the time of their formation [15 hrs] 3. The principles on which the stratigraphic studies are based include order of superposition, original horizontality, lateral continuity, cross-cutting relationships, inclusions, unconformities, fossil succession, uniformitarianism, and catastrophism. 4. Stratified rocks that are continuous vertically as well as laterally have normal contacts. However, there may be breaks in deposition that constitute an unconformable contact. Likewise, the contact may be faulted, or an igneous rock may produce an intrusive contact. 47. The breaks in deposition or unconformities can be of various types like angular unconformity, non-conformity, disconformity, paraconformity or diastem. 48. Stratigraphic studies can be undertaken with simple equipment by taking traverses, recording attitudes, measuring sections, collecting fossils and preparing a stratigraphic column. 49. Stratigraphy helps in unravelling the history of the Earth and organisms through time and helps in location and exploration of minerals, notably fossil fuels. 50. Time in stratigraphy is divided into eons, eras, periods epochs and ages based on important events notably in the evolution of organisms as seen from the fossil record. Thus, a standard scale is prepared that is being periodically

	modified. We can also determine the absolute age of some rocks by radiometric methods.
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	When it comes to learning and teaching stratigraphy, it is important to employ various strategies that cater to different learning styles and maximize understanding and retention. Here are some effective learning and teaching strategies for stratigraphy: 1. Fieldwork and Hands-on Experience: Fieldwork is an essential component of stratigraphy. Engage students in field trips or field-based exercises where they can observe and analyze rock outcrops, interpret sedimentary structures, and collect samples. Hands-on experience allows students to develop observational skills, make connections between theoretical concepts and real-world examples, and enhance their understanding of stratigraphic principles. 2. Visual Aids: Utilize visual aids, such as diagrams, charts, maps, and photographs, to help students visualize and comprehend stratigraphic concepts. Use geological maps to demonstrate the distribution and relationships between different rock units and incorporate stratigraphic columns to illustrate the vertical succession of strata. 3. Virtual Resources: Take advantage of virtual resources, such as interactive online modules, virtual field trips, and digital simulations. These resources can provide students with immersive experiences, allowing them to explore stratigraphic principles and study geological features virtually. 4. Case Studies and Real-life Examples: Present case studies and real-life examples that illustrate the application of stratigraphic principles in various contexts, such as oil and gas exploration, paleoenvironmental reconstructions, or geological hazard assessments. These examples can help students understand the practical significance of stratigraphy and its relevance in different disciplines. 5. Laboratory Work: Conduct laboratory exercises that involve the description and interpretation of rock samples, including the identification of lithology, sedimentary structures, and fossil content. Encourage students to create stratigraphic logs or cross-sections based on the laboratory data, promoting critical thinking and hands-on application of stratigraphic concepts.

	6. Collaborative Learning: Foster collaborative learning environments where students can work in groups or pairs to solve problems, analyze data, or interpret stratigraphic information. This approach encourages active engagement, promotes discussions, and allows students to learn from one another's perspectives and insights. 7. Multimedia Resources: Incorporate multimedia resources, such as videos, animations, and online lectures, to supplement traditional teaching methods. Multimedia resources can help reinforce key concepts, illustrate geological processes, and provide additional visual and auditory learning opportunities. 8. Concept Mapping: Encourage students to create concept maps or diagrams that depict the relationships between different stratigraphic concepts, principles, and processes. Concept mapping enhances critical thinking, promotes knowledge organization, and facilitates the identification of connections between different stratigraphic components. 51. Continuous Assessment and Feedback: Implement regular assessments, such as quizzes, assignments, or class discussions, to gauge student understanding and provide timely feedback. This allows students to monitor their progress, identify areas of improvement, and reinforces learning. 52. Integration of Technology: Utilize geospatial software, stratigraphic modeling tools, and other technology-based resources to enhance the learning experience. These tools can facilitate data analysis, visualization, and interpretation, providing students with valuable skills applicable to the field of stratigraphy. By employing these learning and teaching strategies, educators can create engaging and effective learning experiences in stratigraphy, catering to different learning styles, and promoting a deeper understanding of the subject matter.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem)	79	Structured SWL (h/w)	5
الحمل الدراسي المنتظم للطالب خلال الفصل		الحمل الدراسي المنتظم للطالب أسبوعيا	
Unstructured SWL (h/sem)	71	Unstructured SWL (h/w)	4.5
الحمل الدراسي غير المنتظم للطالب خلال الفصل		الحمل الدراسي غير المنتظم للطالب أسبوعيا	
Total SWL (h/sem)	150		

الحمل الدراسي الكلي للطالب خلال الفصل	
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Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to the Geology of Iraq
Week 2	Tectonic Classification of Iraq
Week 3	Stratigraphic Units of the Early Paleozoic Era in Iraq
Week 4	Stratigraphic Units of the Late Paleozoic Era in Iraq
Week 5	Correlation of Paleozoic Rock Units and paleogeography

Week 6	Stratigraphic Units of the Triassic Periods in Iraq
Week 7	Stratigraphic Units of Jurassic Periods in Iraq
Week 8	Mid Exam
Week 9	• Stratigraphic Units of the Cretaceous Period in Iraq
Week 10	• Comparison of Mesozoic Basins
Week 11	• Stratigraphic Units of the Paleogene Period in Iraq
Week 12	• Stratigraphic Relationships Between the Mesozoic and Paleogene Eras
Week 13	• Stratigraphic Units of the Neogene Period in Iraq
Week 14	• Tectonostratigraphy of the Cenozoic Era (Tertiary)
Week 15	• Stratigraphic Units of the Quaternary Period in Iraq
Week 16	final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: PREPARATION OF A GEOLOGIC CROSS SECTION
Week 2	Lab 2: Tectonic position and settings of Arabian Plate I
Week 3	Lab 3: Tectonic position and settings of Arabian Plate II
Week 4	Lab 4: Interpretation of the Geologic Map for Paleozoic Succession, Northern and central Iraq
Week 5	Lab 5: Interpretation of the Geologic Map for Paleozoic Succession, western and southern Iraq
Week 6	Lab 6: Interpretation of the Geological Map and Cross Section for Mesozoic Succession, Northern and central Iraq

Week 7	Mid Exam
Week 8	Lab 7: Interpretation of the Geological Map and Cross Section for Mesozoic Succession, western and southern Iraq
Week 9	Lab 9: Interpretation of the Facies Map and Determination the Transgression and Regression Stages during Paleozoic and Early Mesozoic
Week 10	Lab 10: Interpretation of the Facies Map and Determination the Transgression and Regression Stages during Late Mesozoic and Cenozoic
Week 11	Lab 11: Lithostratigraphy and biostratigraphy Relationships in Arabian Plate
Week 12	Lab 12: Applied Geological map and field geology of Iraq
Week 13	Lab 13: Calculate the outcrop width of the Iraqi successions
Week 14	Lab 14: Sequence stratigraphy of Iraq
Week 15	Final exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1. Geology of Iraq (Jassim and Goff, 2006) 2. Lexique Stratigraphique International Asie, Iraq. (Bellen et al., 1959) 3. Regional geology of Iraq (Buday, 1980) 4. Petroleum geology of Iraq (2010)	Yes
Recommended Texts	Lexique Stratigraphique International Asie, Iraq. (Bellen et al., 1959)	Yes
Websites		

Grading Scheme				
مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Scientific Research Methodology		Module Delivery
Module Type	B		☒ Theory ☐ Lecture
Module Code	UOB-309		
ECTS Credits	1		
SWL (hr/sem)	25		
Module Level	3	Semester of Delivery	6
Administering Department	Geology	College	Sciences
Module Leader	Dr. Mohammed Hassan	e-mail	mohammed.nasser@sc.uobaghdad.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor		e-mail	
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/10/2025	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Research methodology	Semester	5
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	22. Importance of Knowing How Research is Done. 23. Learn the Criteria of Good Research

	24. Learn how to find good resources for your research 25. Understand the meaning of a Hypothesis
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	53. Increasing the ability of student to write their own graduate projects. 54. Increasing the ability of student to choose good resources 55. Encourage students to read and understand geologic papers to get familiar with how to write a good paper.
Indicative Contents المحتويات الإرشادية	In a thesis, dissertation, academic journal article or other formal pieces of research, there are often details of how the researcher approached the study and the methods and techniques they used. If a student is designing a research study, then it's helpful to understand what research methodology is and the selection of techniques and tools available to him. In this module, we explore what research methodology is, the types of research methodologies and the techniques and tools commonly used to collect and analyze data.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	This step-by-step guide takes students through the entire writing process, from understanding their assignment to proofreading their final draft. 1. Understand the assignment 2. Choose a research paper topic 3. Conduct preliminary research 4. Develop a thesis statement 5. Create a research paper outline 6. Write a first draft of the research paper 7. Write the introduction 8. Write a compelling body of text 9. Write the conclusion 10. The second draft 11. The revision process 12. Research paper checklist 13. Free lecture slides

Student Workload (SWL) الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	5
Unstructured SWL (h/sem)	71	Unstructured SWL (h/w)	5

الحمل الدراسي غير المنتظم للطلاب خلال الفصل		الحمل الدراسي غير المنتظم للطلاب أسبوعيا	
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Attending lectures	1	10% (10)	all	continue
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr.	10% (10)	7	LO # 1-7
	Final Exam	3 hr.	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	MEANING OF RESEARCH In this lecture the research is defined and explained the purpose of the research and finally explains types of research.
Week 2	Defining the Research Problem In this lecture we explain the first and foremost step happens to be that of selecting and properly defining research problem and discuss research problem, selecting the problem, defining the problem and finally the conclusion
Week 3	How To Write A Complete Final Year Project: Chapter One To Five
Week 4	Explain the important steps of writing a final year project

Week 5	How to write previous studies How to read a paper How to summarize a paper
Week 6	Tips for writing a Perfect Paper Introduction This lecture explains the main points in writing a good introduction for a paper, dissertation or thesis.
Week 7	What should you include in an introduction for a research paper? Research paper introductions are always unique. After all, research is original by definition. Here we list six important items to be included in the introduction
Week 8	Midterm Exam
Week 9	A STEP BY STEP GUIDE ON RESEARCH PROJECT WRITING FOR UNIVERSITIE Explain the Undergraduate research project Clarify the typical formats for the project
Week 10	How to write your references ?
Week 11	How to choose a good scientific website to add your references?
Week 12	How to choose a subject for your research project?
Week 13	Prepare your own project Choose a subject Choose references Students are asked to do their research project as an example for the final year project
Week 14	Discuss the student work
Week 15	
Week 16	Preparatory week before the final Exam

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group	A - Excellent	امتياز	90 - 100	Outstanding Performance

(50 - 100)	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Research methodology, method and techniques, C.R. Kothari	Yes
Recommended Texts		
Websites		



Ministry of Higher Education and
Scientific Research - Iraq
University of Baghdad
College of Sciences
Department of Geology



جامعة بغداد / كلية العلوم

قسم علم الارض

مواد المرحلة الرابعة

الفصل الدراسي الاول

و

الفصل الدراسي الثاني

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Engineering Geology		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	GEO4832		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	4	Semester of Delivery	7
Administering Department	Geology	College	Sciences
Module Leader	Thair thamer iltayif al-samarrai	e-mail	Thair.t@sc.uobaghdad.edu.iq
Module Leader's Acad. Title	Assist. Prof.	Module Leader's Qualification	Ph.D.
Module Tutor	Prof. Hamid Hassan	e-mail	hamid.h@sc.uobaghdad.edu.iq
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/09/2025	Version Number	1.0

Relation with other Modules	
العلاقة مع المواد الدراسية الأخرى	
Prerequisite module	Semester

Co-requisites module	None	Semester	
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Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	26. understanding the basics of engineering geology and linking geology with engineering as far as common issues are concerned. 27. mainly represented by engineering geotechnical examinations and analyzes of ground materials, namely soil and rocks. 28. to reveal the locations of engineering facilities through analysis and interpretation of the results obtained from those examinations and even some measured results from the field.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	56. Knowledge and understanding of the basics of engineering geology 57. Engineering examinations and analyzes, through which it is possible to know the suitable ground materials for the work of engineering projects and the materials suitable for various industries.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. We have introduced you to the basic principles of engineering geology. Let us now summarize what you have learned in this unit. 1. Engineering geology is a branch of Geology which deals with the outcrops of rocks in the field and all the tests on rock and soil. 2. It focuses primarily engineering constructions and geological hazard. It also includes study of measurements all data in the field [15 hrs]

	1. Develop field engineering skills by conducting all measurements and field checks 2. 2- Develops understanding and linking between engineering topics and other related topics 3. 3- Solution to some engineering geological problems in engineering sites and facilities [15 hrs]. 4. Field geology studies can be undertaken with simple equipment by taking traverses, recording attitudes, measuring sections, collecting fossils and preparing a stratigraphic column[15 hrs]. 5. Engineering geology helps in unravelling the history of the Earth and organisms through time and helps in location and exploration of minerals.
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	When it comes to learning and teaching engineering geology, it is important to employ various strategies that cater to different learning styles and maximize understanding and retention. Here are some effective learning and teaching strategies for engineering geology: 1. Fieldwork and Hands-on Experience: Fieldwork is an essential component of engineering geology. Engage students in field trips or field-based exercises where they can observe and analyze rock outcrops, interpret sedimentary structures, and collect samples. Hands-on experience allows students to develop observational skills, make connections between theoretical concepts and real-world examples, and enhance their understanding of eng.geo. principles. 2. Visual Aids: Utilize visual aids, such as diagrams, charts, maps, and photographs, to help students visualize. Use geological maps to demonstrate the distribution and relationships between different rock units and incorporate stratigraphic columns to illustrate the vertical succession of strata. 3. Case Studies and Real-life Examples: Present case studies and real-life examples that illustrate the application of eng. Geo. principles in various contexts, such as oil and gas exploration, paleoenvironmental reconstructions, or geological hazard assessments. These examples can help students understand the practical significance of stratigraphy and its relevance in different disciplines.

	4. Laboratory Work: Conduct laboratory exercises that involve the description and interpretation of rock and soil samples, including the identification geotechnical tests. 5. Collaborative Learning: Foster collaborative learning environments where students can work in groups or pairs to solve problems, analyze data, or interpret engineering information. This approach encourages active engagement, promotes discussions, and allows students to learn from one another's perspectives and insights. 6. Multimedia Resources: Incorporate multimedia resources, such as videos, animations, and online lectures, to supplement traditional teaching methods. Multimedia resources can help reinforce key concepts, illustrate geological processes, and provide additional visual and auditory learning opportunities. 7. Concept Mapping: Encourage students to create concept maps or diagrams that depict the relationships between different eng. concepts, principles, and processes. Concept mapping enhances critical thinking, promotes knowledge organization, and facilitates the identification of connections between different eng. components. 6. Continuous Assessment and Feedback: Implement regular assessments, such as quizzes, assignments, or class discussions, to gauge student understanding and provide timely feedback. This allows students to monitor their progress, identify areas of improvement, and reinforces learning. 7. Integration of Technology: Utilize geospatial software, eng. Geo. modeling tools, and other technology-based resources to enhance the learning experience. These tools can facilitate data analysis, visualization, and interpretation, providing students with valuable skills Eng. Geo. applicable.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem)	79	Structured SWL (h/w)	5
الحمل الدراسي المنتظم للطالب خلال الفصل		الحمل الدراسي المنتظم للطالب أسبوعيا	
Unstructured SWL (h/sem)	71	Unstructured SWL (h/w)	4.5
الحمل الدراسي غير المنتظم للطالب خلال الفصل		الحمل الدراسي غير المنتظم للطالب أسبوعيا	
Total SWL (h/sem)	150		

الحمل الدراسي الكلي للطالب خلال الفصل	
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Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 8
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	8	LO # 1-7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Engineering Geology – general notes Engineering problems – references
Week 2	Soil Analysis, particle size analysis grading curves analysis. Atterberg limits
Week 3	Casagrande Plasticity Chart, Casagrande Classification of Soil
Week 4	Determination of Atterberg Limits (LL and PL). flow curve

Week 5	Compaction, consolidation. Triaxial test, and Mohr Diagram, ϕ and c .
Week 6	Static elastic moduli: mod. of compression, true mod. of elasticity. Tangent modulus. Secant modulus.
Week 7	Dynamic Moduli of Elasticity: Young's Modulus E_d , Poisson's Ratio ν_d , Shear Modulus G_d .
Week 8	Medet Exam,
Week 9	Pressure in Earth Masses Boussinesq and Westergaard Methods
Week 10	2:1 Method. and Newmark's Chart.
Week 11	Dams: types, materials, cross-sections, site selection
Week 12	Slope stability: Modes of failure, Conditions for Sliding (plane and wedge), Toppling and Rockfall
Week 13	Tunnels: terminology, factors affecting stability of tunnels
Week 14	Construction materials: Aggregates, cement, alkali reactions
Week 15	Roads – layers of road, road prism
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab1: Physical properties of soil. Density, specific gravity, moisture content
Week 2	Lab2: Three weights case: (Dry, Saturated and submerged weights)

Week 3	Lab3: Soil classification: A. Grading curves and classification of coarse soil
Week 4	Lab4: Soil classification: B. Plasticity Chart and Classification of Fine Soil
Week 5	Lab5: Determination of liquid limit (LL) and plastic limit (PL) of fine soil .
Week 6	Lab6: AASHTO Soil Classification System
Week 7	Lab7: Pressure in Earth Masses: 1) Boussinseq and Westergaurds Methods 2 : 1 Method
Week 8	Lab8: Pressure in Earth Masses: Newmark's Chart method
Week 9	Lab9: Modulus of Elasticity and Poisson's ratio
Week 10	Lab10: Effective stress on soil
Week 11	Lab11: Triaxial compression test for rock / Brittle rock
Week 12	Lab12: Triaxial compression test for rock / Ductile rock
Week 13	Lab13: Classification system of discontinuities of rock
Week 14	Lab14: Force acting on dams
Week 15	Lab15: Rock Slope Stability Analysis by Stereographic projection

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Principle of engineering geology	Yeas

Recommended Texts	Engineering Geology and Geotechnics	no
Websites		

Grading Scheme				
مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Subsurface Geology		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	GEO4833		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	4	Semester of Delivery	7
Administering Department	Geology	College	Sciences
Module Leader	Buraq Adnan Hussein	e-mail	buraq.hussein@sc.uobaghdad.edu.iq
Module Leader's Acad. Title	Ass. Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Thamer Abdullah Mahdi	e-mail	thamer.mahdi@sc.uobaghdad.edu.iq
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/09/2025	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Subsurface Geology	Semester	5
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	This module offers students the basic understanding of geological mapping principles, and techniques, in addition to well logs analysis. It presents the different methods of subsurface geologic mapping, including subsurface maps and cross sections, and different types of well logs and their applications in stratigraphy and structural geology of the oilfields.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	On successful completion of this module, a student will be able to: - make basic observations and measurements from drilling wells. - produce subsurface maps (structural, thickness, facies). - produce subsurface structural and stratigraphic cross sections based on drilling wells and well logs data. - analyse subsurface geological data using conventional, and digital methods. - to visualize the geology of the oil field based on subsurface data. - make basic observations and readings from well logs. -Qualitative interpretation of well logs to predict lithology and fluid types. -Selected well logs calculations (SP, GR logs).
Indicative Contents المحتويات الإرشادية	-Introduction to subsurface geology. -Drilling wells terminology. -Subsurface data types. -Acquisition of drilling related data and its uses. - Subsurface maps (structural, thickness, facies). - Subsurface cross sections (structural, stratigraphic).

	-Geomodeling -Basics of well loggings. -SP and GR logs. -Porosity logs. -Resistivity logs.
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

Subsurface geology is linked different branches of geological sciences that can be applied to petroleum exploration. During the module, students learn principles and techniques for subsurface geologic interpretation through inquiry-based, hands-on activities using typical oil fields data. Classwork will include activities such as construction of subsurface maps and cross-sections, and interpretation of well logs. Outside-of-classroom work will include readings, videos and shorter written assignments. Each student will give an individual report to the instructor characterizing many exercises.

The module will concentrate on active, inquiry-based learning and will learn how to interpret and integrate various subsurface datasets available in oilfields.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	71	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.5

Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	150
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Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 8
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	8	LO # 1-7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المناهج الاسبوعي النظري

	Material Covered
Week 1	Subsurface geologic data
Week 2	Drilling wells
Week 3	Subsurface structural and thickness maps
Week 4	Facies maps
Week 5	Subsurface geologic cross sections

Week 6	Basics of well logging
Week 7	Gamma ray log
Week 8	Midterm Exam 1
Week 9	SP log
Week 10	Neutron log
Week 11	Density log
Week 12	Sonic log
Week 13	Resistivity logs
Week 14	Sw calculation and hydrocarbon saturation
Week 15	well logs interpretation
Week 16	Midterm Exam 2 and Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Drilling wells data management
Week 2	Lab 2: Structural maps interpretation
Week 3	Lab 3: Thickness maps interpretation
Week 4	Lab 4: Facies maps interpretation
Week 5	Lab 5: Interpretation of combined structural maps
Week 6	Lab 6: Subsurface geologic cross sections
Week 7	Lab 7: Well logs correlation

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts		Yes
Recommended Texts	Basic well logs Analysis for Geologists. 2004 Tearpock and Bischke (2002),Applied Subsurface Geological Mapping	No
Websites		

Week 8	Lab 8: Midterm Exam 1
Week 9	Lab 9: Drilling time log
Week 10	Lab 10: Vshale calculation-Gamma ray log
Week 11	Lab 11: Vshale calculation-SP log
Week 12	Lab 12: Caliper log interpretation
Week 13	Lab 13: Porosity logs measurements
Week 14	Lab 14: Qualitative well log interpretation-Lithology
Week 15	Lab 15: Midterm Exam 2 and Preparatory week before the final Exam

Grading Scheme				
مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings

	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Geochemistry		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	GEO4834		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	4	Semester of Delivery	7
Administering Department	Geology	College	Sciences
Module Leader	Firas Mudhafar Abdulhussein	e-mail	firmas.mudhafar@sc.uobaghdad.edu.iq
Module Leader's Acad. Title	Assistant Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Dr. Rana Ali	e-mail	rana.ali@sc.uobaghdad.edu.iq
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/09/2025	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Geochemistry	Semester	8
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	29. Contribute to the process of scientific progress, raise the level of education, and provide the labor market with graduates to work in all fields of the country's oil, mineral and environmental investment. 30. Training students on how to take field models and convert them into applied products used in making geological maps. 31. Acquisition of students the basic skills that will develop their cognitive and intellectual levels. 32. Cooperate with state departments to provide scientific consultations and conduct various tests to complete scientific research in all different geological fields. 33. Conduct scientific research that serves the community in various geological fields.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	58. Acquiring the ability and skill in field interpretation and elicitation. 59. Acquiring the skill of distinguishing between different geological features. 60. Dealing with the basic laws of various earth sciences.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Geochemistry is the science concerned with the chemistry of the earth. It deals with the distribution and migration of the chemical elements within the earth. The main focus of geochemistry is to; 1. Understand the principles governing the distribution and re-distribution of elements, ionic species and isotope ratios in earth materials, so that we can

	interpret the formation of mineral assemblages: conditions (P, T, etc.), processes (magmatic crystallization, weathering, chemical precipitation, metamorphism, etc.), and even the age. [15 hrs] - Predict changes in mineral assemblages (minerals, concentrations of elements, isotopic ratios) if a given mineral assemblage is subjected to different conditions (T, P, interaction with a fluid, etc.) [15 hrs]. - Geochemistry plays an important role in forecasting the quality of crude oil in the accumulation. - Study of the chemical composition of the Earth and other planets. [15 hrs]. - Study of the chemical processes and reactions that govern the composition of rocks, water, and soils. - The major task of geochemistry is to investigate the composition of the Earth as a whole and of its various components and to uncover the laws that control the distribution of the various elements. [15 hrs] - The determination of the relative and absolute abundances of elements and the isotopes in the earth. - The study of distribution and migration of the individual elements in the various parts of the earth (the atmosphere, hydrosphere, crust, etc.). [15 hrs]
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Geochemistry uses the tools of chemistry to understand processes on Earth. The basis of the geochemist's work is the quantification of the elements. When it comes to learning and teaching geochemistry, it is important to employ various strategies that cater to different learning styles and maximize understanding and retention. Here are some effective learning and teaching strategies for geochemistry: Fieldwork (Sampling): the sampling depends on the goal of the work performed. We may sometimes need a site sample, a representative layer, a surface or a deep sample, or a core or a vegetative sample (a vegetative medium). In all cases, there must be a statistical representation of the samples. In the case of soil and rocks, we need to dry, crush and grind into a fine powder. Whereas, there are samples that need to be screened as specific grain size is treated for all samples. As for the plant samples, they are burned and ash is treated. As for the water samples, some of the analyzes must be
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	in situ, such as pH, oxidation, and H₂S fixation, while the rest is analyzed within 24 hours to prevent oxidation, reduction, or precipitation. 2. Visual Aids: Utilize visual aids, such as diagrams, charts, maps, and photographs, to help students visualize and comprehend geochemistry concepts. 3. Virtual Resources: Take advantage of virtual resources, such as interactive online modules, virtual field trips, and digital simulations. These resources can provide students with immersive experiences, allowing them to explore geochemistry principles and study geological features virtually. 4. Case Studies and Real-life Examples: Present case studies and real-life examples that illustrate the application of geochemistry principles in various contexts, such as oil and gas exploration. 5. Laboratory Work: Conduct laboratory exercises that involve the description and interpretation of the distribution of the chemical elements within the earth. 6. Collaborative Learning: Foster collaborative learning environments where students can work in groups or pairs to solve problems, analyze data, or interpret stratigraphic information. This approach encourages active engagement, promotes discussions, and allows students to learn from one another's perspectives and insights. In general, the main objective of geochemical studies is to discover useful deposits of ores. In addition, geochemistry helps in solving many geological issues such as determining the age and origin of rocks, minerals and ores.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	46	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 8
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	8	LO # 1-7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction of Geochemistry
Week 2	Origin & Development of the Solid Earth
Week 3	Earth's Spheres & Earth's Interior
Week 4	Meteorites
Week 5	Geochemical classification of the elements
Week 6	Chemical weathering

Week 7	Ionic potential & Sorption
Week 8	Midterm Exam
Week 9	Ionic Substitution
Week 10	Hydrogen-Ion Concentration(pH)& Oxidation-Reduction Potentials (Eh)
Week 11	Colloids and Colloidal Processes
Week 12	Trace elements
Week 13	Clay Minerals
Week 14	Hydrogeochemistry /Physical and Physico-chemical
Week 15	Metallic elements & Non-metallic constituents
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Soil, river, and rock sampling survey
Week 2	Lab 2: Units (ppm, ppb, molarity, molality)
Week 3	Lab 3: Major and trace element calculating by Atomic Absorption Spectrometry
Week 4	Lab 4: Precision and accuracy of analyses
Week 5	Lab 5: Calculation of chemical formula
Week 6	Lab 6: Insoluble Residue
Week 7	Lab 7: Calculating of mineral percent by X-ray diffraction
Week 8	Lab 8: Identification of water type by hydrochemical formula

Week 9	Lab 9: Identification of water type by Stiff diagram
Week 10	Lab 10: Identification of pH, TDS, Ec, and T
Week 11	Lab 11: Identification of water type by Piper diagram
Week 12	Lab 12: Identification of hypothetical salts and water type
Week 13	Lab 13: Classification of calcium and magnesium ions in water sample
Week 14	Lab 14: Calculation of Chemical Index Weathering and Chemical Index Alteration
Week 15	Lab 15: Identification of Cl and SO ₄ in water

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1. Mason, B, (1958): Principles of geochemistry. Third edition. John Wiley & Sons. New York.329P. 2. Drever, J.I.,(1997): The Geochemistry of Natural Water, Surface and Groundwater Environments, 3rd edition, Prentice Hall, USA, 436p.	Yes

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
	A - Excellent	امتياز	90 - 100	Outstanding Performance
Success Group (50 - 100)	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded

(0 – 49)	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Environmental Geology		Module Delivery
Module Type	Core		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	GEO4835		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	4	Semester of Delivery	7
Administering Department	Geology	College	Sciences
Module Leader	Dr. Enaam Jumaa Abdullah	e-mail	anam.g@sc.uobaghdad.edu.iq
Module Leader's Acad. Title	Assistant Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Dr. Hind Fadhil	e-mail	hind.abdullah1108@sc.uobaghdad.edu.iq
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/09/2025	Version Number	1.0

Relation with other Modules	
العلاقة مع المواد الدراسية الأخرى	
Prerequisite module	None
Semester	

Co-requisites module	None	Semester	
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Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	34. Understanding Earth–Environment Interactions – To analyze how geological processes such as erosion, earthquakes, floods, and landslides affect ecosystems and human activities. 35. Identifying and Managing Natural Hazards – To assess geological risks and develop strategies for reducing the impacts of natural disasters on communities. 36. Sustainable Use of Earth Resources – To ensure responsible extraction and management of resources like water, minerals, and soil while minimizing environmental damage.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	61. Demonstrate understanding of fundamental principles of geology and their relevance to environmental issues. 62. Identify, assess, and interpret geological hazards such as landslides, earthquakes, and floods. 63. Use geological mapping, sampling, and data analysis techniques to investigate environmental problems. 64. Propose and justify strategies for managing natural resources and mitigating environmental impacts.
Indicative Contents المحتويات الإرشادية	Introduction to Environmental Geology – Scope, importance, and relationship between geology, environment, and society. Geological Hazards – Causes, impacts, and mitigation of earthquakes, landslides, floods, volcanoes, and coastal hazards. Earth Resources and Sustainability – Management of water, soil, minerals, and energy resources with a focus on environmental protection. Human–Environment Interactions – Effects of urbanization, mining, waste disposal, and climate change on geological systems.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Lectures and Multimedia Presentations – Deliver core concepts using visuals, case studies, and real-world examples. 2. Fieldwork and Site Visits – Provide hands-on experience in observing and analyzing geological features and environmental issues. 3. Practical Laboratory Sessions – Develop skills in sample analysis, mapping, and data interpretation. 4. Group Projects and Discussions – Encourage teamwork, critical thinking, and problem-solving on environmental challenges.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	53
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	46	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Earthquake
Week 2	Volcanoes
Week 3	Flooding
Week 4	Coastal Zones
Week 5	Mass Movements
Week 6	Climate Change
Week 7	Oceans Reservoirs
Week 8	Desertification and Desert
Week 9	Natural Recourses / Rocks-mineral-soil

Week 10	Natural Recourses/ Water
Week 11	Alternative Energy/ Fossil Fuels
Week 12	Alternative Energy/ Nuclear power
Week 13	Alternative Energy/ solar energy
Week 14	Alternative Energy/ Geothermal/ electrical power
Week 15	Environmental Laws
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Earthquake magnitude classification hazards exercise
Week 2	Lab 2: Volcanic Risk Hazards case study
Week 3	Lab 3: Flooding Risk Hazards exercise
Week 4	Lab 4: coastal region changing/ case study
Week 5	Lab 5: Mass Movements types and related hazards exercise
Week 6	Lab 6: Climate classification exercise
Week 7	Lab 7: Climate Change/ case study
Week 8	Lab 8: oceans actions /case study

Week 9	Lab 9: desertification / case study
Week 10	Lab 10: Rocks and minerals reports
Week 11	Lab 11: Water quality calculation
Week 12	Lab 12: fossil fuel oil spills / case study
Week 13	Lab 13: Nuclear power disasters / case study
Week 14	Lab 14: Solar energy environmental limitation/ case study
Week 15	Lab 15: Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1-Environmental geology (Montgomery, 2006)	Yes
Recommended Texts	2-Environmental Geology/ Handbook of Field Methods and Case Studies (Klaus et al., 2007)	No
Websites	https://www.googleadservices.com/ https://www.googleadservices.com/	

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.



Ministry of Higher Education and
Scientific Research - Iraq
University of Baghdad
College of Sciences
Department of Geology



جامعة بغداد / كلية العلوم

قسم علم الارض

مواد المرحلة الرابعة

الفصل الدراسي الثاني

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Water Resources		Module Delivery
Module Type	Core		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	GEO4938		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	4	Semester of Delivery	8
Administering Department	Geology	College	Sciences
Module Leader	Qusai y. Al-Kubaisi,	e-mail	qusai.salman@sc.uobaghdad.edu.iq
Module Leader's Acad. Title	Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Iman A. Al-Ali	e-mail	Iman.ali@sc.uobaghdad.edu.iq
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/10/2025	Version Number	1.0

Relation with other Modules	
العلاقة مع المواد الدراسية الأخرى	
Prerequisite module	None
Semester	

Co-requisites module	None	Semester	
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Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Contribute to the development of the student's skills in identifying the calculation of the amount of water resources coming to Iraq and their most important sources and ways to preserve them. 2. Studying the climate parameters that affecting on the water resources as well as determine the water budget as water surplus and water deficit. 3. Training the student on the most important methods of determining the hydrochemistry of water and the classification of water type and water formula, to determine their suitability for different purposes. 4. Training students to identify the amounts of water that infiltrated into the ground as groundwater, as well as calculate its value. 5. Training the student to determine the general trend of groundwater movement by plotting the flow net map. 6. Determine the hydraulic properties of the wells by using this and Jacob methods.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	65. Acquiring the ability and skills to determine the water resources management as surface and groundwater and the main factors affecting on it. 66. Acquiring the skill computing the water budget and water type classification. 67. Creating a generation capable of dealing wisely with water resources as the initial source of life and identifying the most important factors affecting the water scarcity. 68. Learning the main principles of water resources management in Iraq
Indicative Contents المحتويات الإرشادية	Indicative content includes the following.

Part A - Circuit Theory

We have introduced you to the basic principles of water resources.

Let us now summarize what you have learned in this unit; Indicative content includes the following. Let us now summarize what you have learned in this unit;

1. Hydrology is the scientific study of the movement, distribution, and management of water on Earth and other planets, including the water cycle, water resources, and drainage basin sustainability. A practitioner of hydrology is called a hydrologist. Hydrologists are scientists studying earth or environmental science, civil or environmental engineering, and physical geography
2. It focuses primarily on using various analytical methods and scientific techniques, they collect and analyze data to help solve water-related problems such as environmental preservation, natural disasters, and water management.
3. Hydrology subdivides into surface water hydrology, groundwater hydrology (hydrogeology), and marine hydrology. Domains of hydrology include hydrometeorology, surface hydrology, hydrogeology, drainage basin management, and water quality.
4. Water quality refers to the chemical, physical, and biological characteristics of water based on the standards of its usage. It is most frequently used by reference to a set of standards against which compliance, generally achieved through the treatment of the water, can be assessed. The most common standards used to monitor and assess water quality convey the health of ecosystems, the safety of human contact, the extent of water pollution, and the condition of drinking water. Water quality has a significant impact on water supply and oftentimes determines supply options.

Part B -

Fundamentals

Most current environmental laws focus on the designation of particular uses of a water body. In some countries these designations allow for some water contamination as long as the particular type of contamination is not harmful to the designated uses. Given the landscape changes (e.g., land development,

	urbanization, and clearcutting in forested areas) in the watersheds of many freshwater bodies, returning to pristine conditions would be a significant challenge. In these cases, environmental scientists focus on achieving goals for maintaining healthy ecosystems and draw the hydrograph to explain the effect of the natural condition on water resources management [15 hrs]
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	When it comes to learning and teaching in hydrology and water resources, it is important to use different strategies that cater to different learning styles and maximize understanding and retention. Here are some effective learning and teaching strategies for water resources: 1. Fieldwork and practical experience: Fieldwork is an essential component of hydrology. Engage students in field trips or field exercises where they can observe and analyze pumping tests, measure climatic parameters to plot the relationship between them and show temporal variation over time, interpret water parameters, and collect samples. Practical experience allows students to develop observational skills, make connections between theoretical concepts and real-life examples, and enhance their understanding - course-specific skills 1. Acquire the ability and skills necessary to determine the management of water resources, whether surface or groundwater, and the main factors affecting them. 2. Acquire the skill of calculating the water budget and classifying water types.

	3. Creating a generation capable of dealing wisely with water resources as the primary source of life and recognizing the most important factors affecting water scarcity. 4. Identify the basic principles of water resources management in Iraq. C- Teaching and learning methods We introduce the student to the basic principles of water resources through: 1. Mainly focusing on the use of various analytical methods and scientific techniques, they collect and analyze data to help solve water-related problems such as environmental conservation, natural disasters, and water management. 3. Introducing the student to the types of hydrology, such as surface water hydrology, groundwater hydrology (water geology), and marine hydrology. Areas of hydrology include hydrometeorology, surface hydrology, hydrogeology, drainage basin management, and water quality. 4. Familiarize the student with the determinants of water quality and the chemical, physical, and biological properties of water based on the criteria for its use. It is most often used in reference to a set of criteria against which compliance, generally achieved through water treatment, can be assessed. The most common criteria used to monitor and evaluate water quality convey the health of ecosystems, safety of human contact, extent of water pollution, and condition of drinking water. Water quality has a major impact on water supplies and often determines supply options. 5. Identify current environmental laws and determine specific uses for water bodies. In some countries, these designations allow some water pollution as long as the specific type of pollution does not harm the specific uses. Due to landscape changes (e.g., land development, urbanization, logging in forest areas) in watersheds of many freshwater bodies, returning to original conditions will be a major challenge. In these cases, ecologists focus on achieving the goals of maintaining healthy ecosystems and draw a hydrograph to explain the impact of the natural state on water resource management
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	46	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction - Hydrological Cycle elements
Week 2	Basics of hydrology and hydrogeology
Week 3	Climate and weather parameters
Week 4	skill of calculating the water budget and classifying water types.
Week 5	River discharge and Flow rating Curve
Week 6	Review of Inductor and Capacitor as Circuit Elements, Source-free RL and RC Circuits, Transient Response
Week 7	Hydrograph
Week 8	Seminar in hydrology
Week 9	Infiltration and percolation
Week 10	Midterm Exam
Week 11	Groundwater and Physical properties
Week 12	Groundwater movement and Flow net
Week 13	Types of Aquifers
Week 14	Pumping Test (Theiss method
Week 15	hydraulic properties of wells using the Jacob methods
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Introduction hydrology and statistics
Week 2	Lab 2: evapotranspiration calculation
Week 3	Lab 3: estimating rainfall methods
Week 4	Lab 4: water budget calculation
Week 5	Lab 5: hydrograph
Week 6	Lab 6: flow net maps and groundwater direction flow
Week 7	Lab 7: Infiltration rate calculation

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Engineering hydrology by Wilson Groundwater hydrology by Todd Hydrology by Davies and Dewiest	Yes
Recommended Texts	Water Resources.	No
Websites	http://www.sepmstrata.org/page.aspx?pageid=229	

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Petroleum Geology		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	GEO4939		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	4	Semester of Delivery	8
Administering Department	Geology	College	Science
Module Leader	Buraq Adnan Hussein	e-mail	buraq.hussein@sc.uobaghdad.edu.iq
Module Leader's Acad. Title	Ass. Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Thamer Abdullah Mahdi	e-mail	thamer.mahdi@sc.uobaghdad.edu.iq
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/10/2025	Version Number	1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	Subsurface Geology	Semester	5
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	This module is designed to describe the different elements and processes that constitute the petroleum system. The module presents the origin, types and characteristics of source rocks and hydrocarbons. It contains the reservoir rocks and their petrophysical properties. The hydrocarbon migration and traps are also included in this module. Main oil fields in Iraq and selected case study will be presented, as well. The laboratory work includes the methods of calculation different petrophysical properties of rocks by using well logs.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	On successful completion of this module, a student will be able to: -Understand the petroleum origin, generation, migration, and accumulation in traps. -explain the subsurface fluids hydrodynamic in oil fields. -evaluate source and seal rocks potential -characterise reservoir rocks, calculate porosity, and water saturation. -identify different types of hydrocarbon traps -evaluate the petrophysical properties of rocks through the use of mathematical equations.
Indicative Contents المحتويات الإرشادية	-Origin and generation of oil - Thermal maturation - Types of petroleum components

	- Hydrocarbons migration and accumulation - Sandstone and carbonate reservoirs properties - Seal rocks evaluation -Types of hydrocarbon traps -Petrophysical evaluation of rocks by using well logs - Enhanced oil recovery - Petroleum systems of Iraq
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	During the module, students learn principles and techniques to differentiate between source, reservoir, and seal rocks through inquiry-based, hands-on activities using typical oil fields data. Classwork will include activities such as calculation of petrophysical properties of rocks and interpretation of well logs. Outside-of-classroom work will include readings, videos and shorter written assignments. Each student will give an individual report to the instructor characterizing many exercises. The module will concentrate on active, inquiry-based learning and will learn how to interpret and integrate various subsurface datasets to evaluate reservoir rocks.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	46	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3

Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	125
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Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 8
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	8	LO # 1-7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Origin and generation of oil
Week 2	Thermal maturation

Week 3	Petroleum components
Week 4	Hydrocarbons migration
Week 5	Sandstone reservoirs
Week 6	Carbonate reservoirs
Week 7	Reservoir hydrodynamics and seal
Week 8	Midterm Exam 1
Week 9	Basics of Hydrocarbon traps
Week 10	Structural traps
Week 11	Stratigraphic traps
Week 12	Hydrodynamic and combination traps
Week 13	Oil exploration methods
Week 14	Petroleum systems of Iraq
Week 15	Midterm Exam 2 and Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Reservoir lithology determination from porosity logs
Week 2	Lab 2: Total porosity calculation
Week 3	Lab 3: Porosity-permeability cross plot

Week 4	Lab 4: Reservoir hydrodynamics
Week 5	Lab 5: Reservoir temperature calculation
Week 6	Lab 6: Water saturation calculation
Week 7	Lab 7: oil water contact determination
Week 8	Lab 8: Midterm Exam 1
Week 9	Lab 9: source rock evaluation-1
Week 10	Lab 10: source rock evaluation-2
Week 11	Lab 11: Kerogen type assessment
Week 12	Lab 12: Organic matter evaluation
Week 13	Lab 13: P-D (pressure-depth) plot-1
Week 14	Lab 14: P-D (pressure-depth) plot-2
Week 15	Lab 15: Midterm Exam 2 and Preparatory week before the final Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts		Yes

Recommended Texts	Selley and Sonnenberg, 2014. Elements of Petroleum Geology	No
Websites		

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Ore Geology		Module Delivery	
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	GEO4940			
ECTS Credits	5			
SWL (hr/sem)	125			
Module Level	4	Semester of Delivery		8
Administering Department	Geology	College	Sciences	
Module Leader	Enaam Jumaa Abdullah		e-mail	anam.g@sc.uobaghdad.edu.iq
Module Leader's Acad. Title	Assistant Professor		Module Leader's Qualification	Ph.D.
Module Tutor	Dr. Rana Abaas		e-mail	rana.ali@sc.uobaghdad.edu.iq
Peer Reviewer Name	Name	e-mail	E-mail	
Scientific Committee Approval Date	01/10/2025	Version Number	1.0	

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	Understand Ore Formation Processes – To explore the geological, geochemical, and tectonic factors that lead to the concentration of valuable minerals. Classify and Characterize Ore Deposits – To learn the types, structures, and mineralogical features of different ore deposits worldwide. Apply Exploration and Evaluation Methods – To develop skills for locating, assessing, and managing mineral resources responsibly.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Explain Ore Genesis – Demonstrate understanding of the geological processes responsible for the formation of various ore deposits. Identify and Classify Ore Types – Recognize and categorize ore deposits based on mineral composition, structure, and formation environment. Apply Exploration Techniques – Utilize geological, geochemical, and geophysical methods to locate and evaluate potential ore resources.
Indicative Contents المحتويات الإرشادية	Introduction to Ore Geology – basic concepts, economic importance, and historical background of ore deposits. Field Investigation and Sampling – site surveys, mapping, and systematic collection of ore samples. Laboratory Analysis and Mineral Identification – microscopic, chemical, and physical tests to determine ore composition. Interpretation and Deposit Evaluation – integrating field and lab data to classify deposits and assess economic viability.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	1. Lectures and Multimedia Presentations to explain theoretical concepts and ore deposit models. 2. Field Trips and On-site Training for direct observation of ore bodies and geological structures. 3. Laboratory Practical Sessions for mineral identification, thin section study, and geochemical analysis. 4. Case Studies and Research Projects to apply knowledge in solving real-world ore geology problems.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	46	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

	Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
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Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Definition of Ore Geology
Week 2	Ore deposits mineral groups
Week 3	Ore deposits classification
Week 4	Formation processes of ore deposits
Week 5	magmatic Ore Deposits
Week 6	Hydrothermal Ore Deposits
Week 7	Regolith Ore Deposits
Week 8	Sedimentary Ore Deposits
Week 9	Hydrothermal fluids
Week 10	Morphology of ore bodies

Week 11	Textures of Ore minerals
Week 12	Geochemical exploration
Week 13	Geochemistry of Gemstones
Week 14	Industrial rocks and minerals
Week 15	Ore deposits in Iraq
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Preface/ Reflected light Microscope
Week 2	Lab 2: Optical properties of ore minerals
Week 3	Lab 3: Color /pleochroism
Week 4	Lab 4: Reflectance
Week 5	Lab 5: Hardness
Week 6	Lab 6 Isotropism
Week 7	Lab 7: anisotropism
Week 8	Lab 8: Internal reflections
Week 9	Lab 9: morphology properties
Week 10	Lab 10: Crystal Shape /mode of occurrence
Week 11	Lab 11: Textures

Week 12	Lab 12: textures
Week 13	Lab 13:Twining
Week 14	Lab 14: deformation twin
Week 15	Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1-Ore Geology and Industrial Minerals(ANTHONY M. EVANS, 1993) 2-Ore Deposit Geology (John Ridley,2013)	Yes
Recommended Texts	Ore Deposits: Origin, Exploration : by Sophie Decree (Editor), Laurence Robb (Editor)2019	No
Websites	https://www.amazon.com/Introduction-Ore-Forming-Processes-Laurence-	

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
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	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Environmental pollution		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	GEO4941		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	4	Semester of Delivery	8
Administering Department	Geology	College	Sciences
Module Leader	Murtatha Jabbar Issa	e-mail	murtatha20042000@yahoo.com
Module Leader's Acad. Title	Assistant Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Hind Fadhil abdullah	e-mail	hind.abdullah1108@sc.uobaghdad.edu.iq
Peer Reviewer Name		e-mail	E-mail
Scientific Committee Approval Date	01/10/2025	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Environmental Geology, Geochemistry	Semester	1 st

Co-requisites module	Water resources	Semester	2 nd
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Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Define terminologies in environmental pollution. 2. Describe health problems related to environmental pollution 3. Describe the sources and types of environmental pollution. 4. Explain different techniques of measuring environmental pollution. 5. Explain the legislation concerning environmental pollution. 6. Demonstrate ability to use appropriate equipment and techniques in the identification and control of environmental pollution.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	69. Identify and describe the properties and behavior of contaminants in the environment. 70. Describe the source and historical/current use of common contaminants. 71. 3.Explain the legislative history and the role of governance in environmental health. 72. 4.Apply quantitative skills in environmental problem solving. 73. Predict the presence and fate of contaminants and assess their associated risks.
Indicative Contents المحتويات الإرشادية	-Terminologies used in air, water, noise and soil pollution. -Atmosphere: composition, atmospheric regions. -Radiation balance. Human impact on the earth (green house effects). -Air Pollution: definition, sources of air pollution, major air pollutants, the effects of air pollution, measurements of pollutants, air pollution of major health importance. -Water Pollution: Sources of water pollution, major water pollution, the effects of water pollution, water pollution of major health importance, measurement of pollution, water pollution control.

	-Noise Pollution: Sources of noise, noise as a nuisance, noise and hearing loss, effects of noise on learning ability and work performance, safety aspects of noise, sleep disruption, noise control efforts. -Soil Pollution: Sources of soil pollution, major soil pollution, the effects of soil pollution, soil pollution of major health importance, measurement of pollution, soil pollution control. -Petroleum pollution, health effects from petroleum pollution. -Toxicology: Risk assessment, polychlorinated biphenyl's (PCBs), dioxins, Asbestos, Lead, Mercury, Cadmium, Chromium. Poisonous plants. Hazardous materials and wastes. -Radiation safety: Ionizing and nonionizing radiation, ultra violet radiation, microwaves. -Equipment used in air and soil pollution monitoring and management. -Remediation of contaminated sites.
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	1. Lectures: Lectures can be used to introduce key concepts and theories related to hydrology. Lectures can be delivered in person or online and can include multimedia materials and real-world case studies. 2. Discussions: Discussions can be used to encourage students to reflect on hydrological concepts and to share their own experiences and insights. Discussions can be facilitated in person or online and can be structured as small group discussions or as whole-class discussions. 3. Problem-based learning: Problem-based learning can be used to encourage students to apply hydrological concepts to real-world problems. Students can work in groups to solve problems related to hydrology and present their solutions to the class.
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	4. Field trips: Field trips can be used to give students hands-on experience with hydrological concepts. Field trips can include visits to watersheds, groundwater wells, and monitoring stations. 5. Laboratory exercises: Laboratory exercises can be used to give students hands-on experience with hydrological concepts. Laboratory exercises can include experiments related to precipitation, evapotranspiration, infiltration, and groundwater flow. 6. Computer simulations: Computer simulations can be used to model hydrological processes and to help students understand complex hydrological concepts. Simulations can be used to model surface water hydrology, groundwater flow, and water quality. 7. Assignments: Assignments can be used to assess students' understanding of hydrological concepts. Assignments can include problem sets, case studies, and research papers. 8. Group projects: Group projects can be used to encourage collaboration and teamwork among students. Group projects can include watershed modeling or water resources planning projects. 9. Guest lectures: Guest lectures can be used to bring in experts from industry or academia to share their experiences and insights related to hydrology. Online resources: Online resources such as videos, online lectures, and interactive simulations can be used to supplement in-class instruction and to provide students with additional learning opportunities.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	46	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3

Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	125
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Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	The Reality of Environmental Problems: Requirements and Solutions
Week 2	The Reality of Environmental Problems in Iraq: The Environment and Future Generations
Week 3	Basic Concepts of Environmental Geology
Week 4	Industrial Hazards

Week 5	Examples Sources of Air Pollution
Week 6	Examples and Solutions Sources of Water Pollution
Week 7	Exam 1
Week 8	Limnological Cycle of Lakes Environmental Problems and Solutions
Week 9	Hydrochemical Surveys of Various Water Resources - Classification
Week 10	Pollution Measures
Week 11	Water Pollution Mitigation and Treatments
Week 12	Radioactive Pollution
Week 13	Petroleum Pollution
Week 14	Medical Geology
Week 15	Exam 2

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Air pollution (Particulate matter) تلوث الهواء (الدقائق العالقة)
Week 2	Air pollution (Gases pollution) تلوث الهواء (تلوث الغازات)
Week 3	Air pollution (Heavy metals) تلوث الهواء (العناصر الثقيلة)
Week 4	Water Quality for Human Drinking مواصفات المياه لغرض شرب الانسان
Week 5	Irrigation water quality

	مواصفات المياه لأغراض السقي
Week 6	Water pollution (Metal Index Calculation) تلوث المياه (حساب معامل العناصر الثقيلة)
Week 7	Water pollution (Human health risk assessment) تلوث المياه (حساب الخطر على صحة الإنسان)
Week 8	Groundwater Pollution تلوث المياه الجوفية
Week 9	Soil Pollution (pollution index) تلوث التربة (حساب معامل التلوث)
Week 10	Soil Pollution (Enrichment factor) تلوث التربة (حساب معامل الاغناء)
Week 11	Soil Pollution (metal pollution) تلوث التربة (تلوث العناصر الثقيلة)
Week 12	Geo accumulation factor)(Soil Pollution تلوث التربة (معامل التراكم الجيولوجي)
Week 13	Soil pollution (Human health risk assessment) تلوث التربة (تقييم الخطر على صحة الإنسان)

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	أخطر أنواع التلوث البيئي تلوث المياه وتلوث الهواء كرق التلوث وكيفية الوقاية والحماية منها	Yes
Recommended Texts	كتاب التلوث البيئي – جامعة الموصل Pepper, I. L., Gerba, C. P., and Brusseau, Mark L., 2006; Environmental and pollution science. 2nd ed., Elsevier Academic Press, 628 p. Montgomery, C., W., 2006; Environmental Geology. McGraw Hill, Companies Inc., Boston, 7th ed., 346 P.	yes

Websites	1. USGS Water Resources - Provides access to extensive data on water resources in the United States, including streamflow and groundwater data, water quality data, and water-use data. (https://water.usgs.gov) 2- U.S. Environmental Protection Agency US EPA
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Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Geological Fieldwork Course		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☐ Lab ☒ Tutorial ☒ Practical ☒ Seminar
Module Code	GEO4943		
ECTS Credits	7		
SWL (hr/sem)	175		
Module Level	4	Semester of Delivery	8
Administering Department	Geology	College	Sciences
Module Leader	Aiad Ali Hussien Al-Zaidy With team of field geology	e-mail	Aiad.hussien@sc.uobaghdad.edu.iq
Module Leader's Acad. Title	Assist. Prof	Module Leader's Qualification	Ph.D.
Module Tutor	Name	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/10/2025	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module		Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	10. Understanding the basics of field geology and linking field geology as far as it relates to common topics, which is mainly represented by field observations of all geological phenomena (structural and geomorphological) 11. Knowing how to measure the orientation and inclination of the earth layers because it is considered very necessary for every geologist and is considered the basis for the field 12. Knowing the location fixation And draw the geological map and the geological section.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	74. Knowledge of the basics and principles of field geology 75. Knowledge of working with field tools and devices because they are very necessary, especially those related to the ground layers 76. It is very necessary to get acquainted with and practice all field work, from map orientation and locating sites in the field to measurements of the ground layers in the field and drawing the geological line and the geological section.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. We have introduced you to the basic principles of field geology. Let us now summarize what you have learned in this unit; 1. field geology is a branch of Geology which deals with the outcrops of rocks in the field. 2. It focuses primarily on uses the compasses. It also includes study of measurements all data in the field [15 hrs] 77. Develop skills related to field subjects by conducting all measurements and field checks 78. Develop understanding and linkage between field topics and other related topics 79. It develops thought in the field and in all the small projects and in all disciplines [15 hrs].

	80. The breaks in deposition or unconformities can be of various types like angular unconformity, non-conformity, disconformity, paraconformity or diastem. 81. Field geology studies can be undertaken with simple equipment by taking traverses, recording attitudes, measuring sections, collecting fossils and preparing a stratigraphic column[15 hrs]. 82. Field geology helps in unravelling the history of the Earth and organisms through time and helps in location and exploration of minerals.
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	When it comes to learning and teaching field geology, it is important to employ various strategies that cater to different learning styles and maximize understanding and retention. Here are some effective learning and teaching strategies for stratigraphy: 1. Fieldwork and Hands-on Experience: Fieldwork is an essential component of stratigraphy. Engage students in field trips or field-based exercises where they can observe and analyze rock outcrops, interpret sedimentary structures, and collect samples. Hands-on experience allows students to develop observational skills, make connections between theoretical concepts and real-world examples, and enhance their understanding of stratigraphic principles. 2. Visual Aids: Utilize visual aids, such as diagrams, charts, maps, and photographs, to help students visualize. Use geological maps to demonstrate the distribution and relationships between different rock units and incorporate stratigraphic columns to illustrate the vertical succession of strata. 3. Virtual Resources: Take advantage of virtual resources, such as interactive online modules, virtual field trips, and digital simulations. These resources can provide students with immersive experiences, allowing them to explore stratigraphic principles and study geological features virtually. 4. Case Studies and Real-life Examples: Present case studies and real-life examples that illustrate the application of stratigraphic principles in various contexts, such as oil and gas exploration, paleoenvironmental reconstructions, or geological
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	hazard assessments. These examples can help students understand the practical significance of stratigraphy and its relevance in different disciplines. 5. Laboratory Work: Conduct laboratory exercises that involve the description and interpretation of rock samples, including the identification of lithology, sedimentary structures, and fossil content. Uses Brunton and Silva compasses. 6. Collaborative Learning: Foster collaborative learning environments where students can work in groups or pairs to solve problems, analyze data, or interpret stratigraphic information. This approach encourages active engagement, promotes discussions, and allows students to learn from one another's perspectives and insights. 7. Multimedia Resources: Incorporate multimedia resources, such as videos, animations, and online lectures, to supplement traditional teaching methods. Multimedia resources can help reinforce key concepts, illustrate geological processes, and provide additional visual and auditory learning opportunities. 8. Concept Mapping: Encourage students to create concept maps or diagrams that depict the relationships between different stratigraphic concepts, principles, and processes. Concept mapping enhances critical thinking, promotes knowledge organization, and facilitates the identification of connections between different stratigraphic components. 83. Continuous Assessment and Feedback: Implement regular assessments, such as quizzes, assignments, or class discussions, to gauge student understanding and provide timely feedback. This allows students to monitor their progress, identify areas of improvement, and reinforces learning. 84. Integration of Technology: Utilize geospatial software, stratigraphic modeling tools, and other technology-based resources to enhance the learning experience. These tools can facilitate data analysis, visualization, and interpretation, providing students with valuable skills applicable to the field geology.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	123	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	7.68
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	52	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.25
Total SWL (h/sem)	175		

الحمل الدراسي الكلي للطالب خلال الفصل	
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Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 8
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	8	LO # 1-7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	• Introduction to Field Geology
Week 2	• Geological Mapping Techniques
Week 3	• Compass and GPS Use in the Field
Week 4	• Rock Identification in Outcrop and Facies Analysis in the Field
Week 5	• Stratigraphic Section Measurement
Week 6	• Structural Data Collection

Week 7	Mid exam
Week 8	• Field Petrology and Mineralogy
Week 9	• Geological Sketching Methods
Week 10	• Sampling Procedures and Ethics
Week 11	• Fossil Documentation Techniques
Week 12	• Diagenetic Features in Outcrop
Week 13	• Cross-Section Construction
Week 14	• Field Data Interpretation and Regional Field Case Studies
Week 15	Final exam
Week 16	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Manual of Field Geology, Geology of Iraq	Yes
Recommended Texts	Geological Field Techniques	yes
Websites		

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
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	F – Fail	راسب	(0-44)	Considerable amount of work required
Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

1. Course Name:	
Signal Processing	
2. Course Code:	
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3. Semester / Year:	
Semester 2 / 2024 - 2025	
4. Description Preparation Date:	
1 / 9 / 2024	
5. Available Attendance Forms:	
Theoretical Attendance	
6. Number of Credit Hours (Total) / Number of Units (Total)	
2 Hours / 2 Units	
7. Course administrator's name (mention all, if more than one name)	
Name: Prof. Dr. Ali Maki Hussein Email: ali.m.@sc.uobaghdad.edu.iq	
8. Course Objectives	
Course Objectives	The course aims to introduce geology students to the different types of geological data and how to convert them into a digital signal that can be processed using various processing methods, such as Fourier analysis to investigate data components and apply various filters to them, and then link the results with the resulting geological variables, such as various ground movements, earthquakes, waves, tides, etc.
9. Teaching and Learning Strategies	

Strategy	Thinking Skills Part 1: General and Transferable Skills (other skills related to employability and personal development). Part 2: Students acquire the ability to communicate with each other and with professors to develop themselves and their skills independently. Part 3: Encourage students to engage in self-learning and expand their knowledge of the course area. Encourage students to think critically and actively participate in classroom discussions. Part 4: Students acquire new communication skills by selecting dialogues that encourage interaction with others. Part 5: Teach students exemplary behavior and cooperation with others.
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10. Course Structure

Theoretical Curriculum

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Knowledge and applied	Types of Geological Data	Attendance	Short exam
2	2	Knowledge and applied	Convert data to digital signal	Attendance	Questions
3	2	Knowledge and applied	Univariate Data	Attendance	Short exam
4	2	Knowledge and applied	Bivariate Data	Attendance	Questions
5	2	Knowledge and applied	Periodic Data	Attendance	Short exam
6	2	Knowledge and applied	Process periodic data	Attendance	Questions
7	2	Knowledge and applied	Real example	Attendance	Questions
8	2	Knowledge and applied	Mid. exam	Attendance	20%
9	2	Knowledge and applied	Fourier analysis	Attendance	Short exam
10	2	Knowledge and applied	Spectrum Analysis	Attendance	Questions
11	2	Knowledge and applied	International observatory data	Attendance	Short exam
12	2	Knowledge and applied	Connect data with geology	Attendance	Questions
13	2	Knowledge and applied	Summer	Attendance	Short exam

14	2	Knowledge and applied	Case study	Attendance	20%
15		Final Exam			60%
11. Course Evaluation					
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc The 40% effort is divided into 20% written exam, 10% seminar presentation (proposed topic), and 10% attendance, class exams, and other student activities. Final 60%					
12. Learning and Teaching Resources					
Required textbooks (curricular books, if any)			“Matlab recipes for earth science” Book		
Main references (sources)			“Statistics and data analysis for earth science” Book		
Recommended books and references (scientific journals, reports...)			From www		
Electronic References, Websites			Wiki and prepared lecture using YouTube		

1. Course Name:					
Radiological method					
2. Course Code:					
\					
3. Semester / Year:					
Semester 2 / 2024 - 2025					
4. Description Preparation Date:					
1 / 9 / 2024					
5. Available Attendance Forms:					
Theoretical and Practical Attendance					
6. Number of Credit Hours (Total) / Number of Units (Total)					
4 Hours / 3 Units					
7. Course administrator's name (mention all, if more than one name)					
Name: Kamal kareem ali Email: kamal.ali@sc.uobaghdad.edu.iq					
8. Course Objectives					
Course Objectives		The course aims to achieve the following: Course Objectives - Understanding the basics of radioactivity - Knowing the types of radiation and radioisotopes, their measurements, and their environmental effects - Using radiometric methods in geological applications - Knowing the different methods for measuring radiation in the field and laboratory			
9. Teaching and Learning Strategies					
Strategy		Using modern presentation methods to present lectures - Viewing available equipment and how it works - Viewing explanatory videos - Field visits to specialized laboratories			
10. Course Structure					
Theoretical Curriculum					
Week	Hours	Required Learning	Unit or subject name	Learning	Evaluation

		ng Outco mes		method	meth od
1	5	Introduction to Radiation and the Atom	Atom and isotopes	powerpoint	Direct questions
2	5	Types of Radiation According to Their Origin	Radioactive History	powerpoint	Discussion
3	5	Field Measurements	ground radiometric method	powerpoint	Quiz

4	5	How to Select and Collect Samples	Sampling	powerpoint	Questions
5	5	Preparing Samples for Measurement	Laboratory gamma ray spectroscopy	powerpoint	Mathematical solutions
6	5	Calculating Decay and Estimating Age	Radiometric dating	powerpoint	Quiz
7	5	Accurate Age Estimation	Rb-Sr dating method	powerpoint	Practical exam
8	5	Bi-Monthly Exam 1	Mid exam	powerpoint	Theoretical and practical question paper
9	5	Well Logging Outputs and Their Reading	Nuclear logs	powerpoint	Discussion
10	5	Student Seminar Presentations	application of radiometric in geology	powerpoint	Discussion
11	5	Types of Ionization and Their Radioactive Effects	ionizing radiation and radiological Aspect	powerpoint	Quiz
12	5	Recommended Limits for Radiation in Water	Radioactivity in water	powerpoint	Questions
13	5	What is Radon and Its Importance	Radon	powerpoint	Mathematical solutions
14	5	Estimating Radiation Doses in Different Environments	Dose estimation	powerpoint	Quiz
15	5	Course Discussion and Second Exam	Exam2	powerpoint	Theoretical and practical question paper
11. Course Evaluation					
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc					
12. Learning and Teaching Resources					
Required textbooks (curricular books, if any)			1. Faure, G. (1986): Principles of isotope geology. 2 nd edition. 2. John Milsom, (2003): Field geophysics. 3 rd edition, wiley&son Ltd., England.		

Main references (sources)	1- Sharma P.V.,(1997): Environmental and engineering geophysics. Cambridge university press, USA. PP.475. 2- IAEA,(1999): Nuclear geophysics and its applications. TECHNICAL REPORTS SERIES No. 393, TRS393.
Recommended books and references (scientific journals, reports...)	Publications of the International Atomic Energy Agency
Electronic References, Websites	ICRP , UNCSEAR