

مواصفات مقرر: الصخور الرسوبية

Course Specification of : Sedimentary Petrology

| General information about the course | | | | | | |
|--------------------------------------|---|---|-------------------|----------------------------------|-------------------|-------------------|
| 1. | اسم المقرر Course Title | Sedimentary Petrology الصخور الرسوبية | | | | |
| 2. | رمز المقرر ورقمه Course Code and Number | GEOS322 | | | | |
| 3. | الساعات المعتمدة للمقرر Credit Hours | الساعات المعتمدة | | | الإجمالي Total | |
| | | محاضرات Lecture | عملي Practical | سمنار/تمارين Seminar/Tutorial | | تدريب Training |
| | | 2 | 1 | NA | NA | 3 |
| 4. | المستوى والفصل الدراسي Study Level and Semester | 3 rd level, 1 st semester | | | | |
| 5. | المتطلبات السابقة للمقرر (إن وجدت) Pre-requisites (if any) | PNR212 | | | | |
| 6. | المتطلبات المصاحبة (إن وجدت) Co-requisites (if any) | NA | | | | |
| 7. | البرنامج الذي يدرس له المقرر Program(s) in which the course is offered | Geosciences | | | | |
| 8. | لغة تدريس المقرر Language of teaching the course | English/Arabic | | | | |
| 9. | نظام الدراسة Study System | Semesters | | | | |
| 10. | مكان تدريس المقرر Location of teaching the course | Faculty of Petroleum and Natural Resources Buildings Sana'a University | | | | |
| 11. | اسم معد (و) مواصفات المقرر Prepared by | Prof. Abdulkarim Al-Subbary | | | | |
| 12. | تاريخ اعتماد مجلس الجامعة Date of Approval | 2020 | | | | |

Course Description

وصف المقرر

This course provide essential concepts for understanding of the processes involved in the genesis of the sedimentary rocks, and outlines on the Identification and description of the various classification schemes for siliciclastic and carbonate rocks; in addition to the weathering processes that alter original properties of primary sediments, sedimentary textures, fabric, composition; sedimentary structures, depositional environments, diagenetic processes and the economic importance of sedimentary geological resources.

يقدم هذا المقرر مفاهيم أساسية لعمليات تكوين الصخور الرسوبية، مع تحديد ووصف مخططات التصنيف المختلفة للصخور الفتاتية والكربونات، بالإضافة إلى عمليات التجوية التي تغير الخصائص الأصلية للرواسب الأولية، والقوام الرسوبي، والنسيج، والتركيب؛ الهياكل الرسوبية، البيئات الترسيبية، عمليات ما بعد النشأة والأهمية الاقتصادية للموارد الجيولوجية الرسوبية

Course Intended Learning Outcomes (CILOs)

مخرجات تعلم المقرر

After completing the course, the student will be able to: || بعد الانتهاء من دراسة المقرر سوف يكون الطالب قادرا على أن:

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Quality Assurance Unit
Assoc.Prof. Adel Al-Matary

Dean of the Faculty
Assoc.Prof. Bassim
AlKhirbash

Dean of the Development
& Quality Assurance Center
Assoc.Prof. Huda Al-Emad

Rector of Sana'a University
Prof. Dr. Al Qaseem Mohammed Abas



| | | | |
|-----|--|---|------|
| a1. | Categorize the different types of sedimentary rocks and recognize its general properties and relation to the source materials. | يصنف الأنواع المختلفة للصخور الرسوبية ويعرف خصائصها العامة وعلاقتها بمواد المصدر. | - a1 |
| a2. | Identify and characterize the processes of weathering and alteration , erosion, transport, deposition and diagenesis of sediments. | يحدد ويوصف عمليات التجوية والتغيير والتعرية والنقل والترسب وانحلال الرواسب. | -a2 |
| b1. | Distinguish between the depositional environments of the various clastic and non-clastic sedimentary rocks . | يُميِّز بين بيئات الترسيب لمختلف الصخور الرسوبية الفتاتية والكربونات | -b1 |
| b2. | Describe how water, wind, and ice can transport sediments. | يصف كيف يمكن للماء والرياح والجليد أن ينقل الرواسب. | - b2 |
| c1. | Use the unique characteristic of sedimentary rocks to identify, classify and describe how sedimentary rocks and its structures form. | يستخدم الخاصية الفريدة للصخور الرسوبية لتحديد وتصنيف ووصف كيفية تشكل الصخور الرسوبية وهياكلها. | - c1 |
| c2. | Conduct measurements of the rock and diagnostic properties of sedimentary rocks to recognize and measure grain sizes in samples, photographs and thin sections . | يجري قياسات للخصائص الصخرية والتشخيصية للصخور الرسوبية للتعرف على أحجام الحبيبات وقياسها في العينات والصور والقطاعات الرقيقة. | - c2 |
| d1. | Transfer information appropriately, verbally, graphically and in writing, using modern information and communication technologies. | ينقل المعلومات بشكل مناسب، شفهاً وبيانياً وكتابةً، باستخدام تكنولوجيات المعلومات والاتصالات الحديثة. | - d1 |
| d2. | Prepare a review report of the different types of sedimentary rock and their economic importance. | يعد تقرير استعراضي لأنواع الصخور الرسوبية المختلفة وأهميتها الاقتصادية | - d2 |

| مواعمة مخرجات تعلم المقرر مع مخرجات التعلم للبرنامج: | | | |
|--|--|--|---|
| Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes) | | | |
| مخرجات التعلم المقصودة من المقرر (Course Intended Learning Outcomes) | | مخرجات التعلم المقصودة من البرنامج (Program Intended Learning Outcomes) (تكتب جميع مخرجات البرنامج كما هي رمزا ونصا) | |
| a1 | Categorize the different types of sedimentary rocks and recognize its general properties and relation to the source materials. | A1 | Express knowledge and understanding of geological-specific theories, paradigms, concepts and principles, in addition to general literature and basic science. |
| a2 | Identify and characterize the processes of weathering and alteration , erosion, transport, deposition and diagenesis of sediments. | A2 | Explain fundamental geological principles and concepts in theoretical, practical and vocational situations and the possibility of applying them. |
| b1 | Distinguish between the depositional environments of the various clastic and non-clastic sedimentary rocks. | B1 | Integrate synthesized geological data on a range of spatial and temporal scales to allow for scientific interpretations. |
| b2 | Describe how water, wind, and ice can transport sediments. | B1 | Integrate synthesized geological data on a range of spatial and temporal scales to allow for scientific |



| | | | |
|----|--|----|---|
| | | | interpretations. |
| c1 | Use the unique characteristic of sedimentary rocks to identify, classify and describe how sedimentary rocks and its structures form. | C1 | Demonstrate the ability to identify rocks, minerals, and different structure in the field and in the lab. |
| c2 | Conduct measurements of the rock and diagnostic properties of sedimentary rocks to recognize and measure grain sizes in samples, photographs and thin sections . | C2 | Apply new and established technologies with efficiency to collect and interpret geological data, recognizing their strengths and limitations. |
| d1 | Transfer information appropriately, verbally, graphically and in writing, using modern information and communication technologies. | D2 | Elucidate the necessary skills of practicing responsible and personal characteristics with discipline, and ability in making decision. |
| d2 | Prepare a review report of the different types of sedimentary rock and their economic importance. | D3 | Demonstrate general and impartial intellectual characteristics beyond the specialization. |

مواءمة مخرجات التعلم باستراتيجيات التعليم والتعلم والتقييم

Alignment of CILOs to Teaching and Assessment Strategies

أولاً: مواءمة مخرجات تعلم المقرر (المعارف والفهم) باستراتيجية التعليم والتعلم والتقييم:

First: Alignment of Knowledge and Understanding CILOs

| | مخرجات المقرر / المعرفة والفهم Knowledge and Understanding CILOs | إستراتيجية التعليم والتعلم Teaching Strategies | إستراتيجية التقييم Assessment Strategies |
|------|--|--|--|
| a1- | Categorize the different types of sedimentary rocks and recognize its general properties and relation to the source materials. | - Lectures - Power point presentation - Class discussion | - Quiz - Exam - Oral question |
| a2 - | Identify and characterize the processes of weathering and alteration , erosion, transport, deposition and diagenesis of sediments. | - Brainstorming - Directed self-study - Practical applications | - Oral presentations - Reports - Practical tests |

ثانياً: مواءمة مخرجات تعلم المقرر (المهارات الذهنية) باستراتيجية التدريس والتقييم:

Second: Alignment of Intellectual Skills CILOs

| | مخرجات المقرر / المهارات الذهنية Intellectual Skills CILOs | إستراتيجية التعليم والتعلم Teaching Strategies | إستراتيجية التقييم Assessment Strategies |
|------|--|---|---|
| b1 - | Distinguish between the depositional environments of the various clastic and non-clastic sedimentary rocks . | - Class Discussion - Tutorial - Lecture | - Homework - Oral question - Quiz - Exam |
| b2 - | Describe how water, wind, and ice can transport sediments. | | |

ثالثاً: مواءمة مخرجات تعلم المقرر (المهارات المهنية والعملية) باستراتيجية التدريس والتقييم:

Third: Alignment of Professional and Practical Skills CILOs

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| مخرجات المقرر/ المهارات المهنية والعملية Professional and Practical Skills CILOs | | إستراتيجية التعليم والتعلم Teaching Strategies | إستراتيجية التقويم Assessment Strategies |
|---|--|---|---|
| c1- | Use the unique characteristic of sedimentary rocks to identify, classify and describe how sedimentary rocks and its structures form. | <ul style="list-style-type: none"> - Lectures - Class Discussion - Lab Experiments - Field training - Tutorial | <ul style="list-style-type: none"> - Short essays - Evaluation of Lab Experiments - Exam - Oral question - Reports |
| c2- | Conduct measurements of the rock and diagnostic properties of sedimentary rocks to recognize and measure grain sizes in samples, photographs and thin sections . | | |

رابعاً: مواءمة مخرجات تعلم المقرر (المهارات العامة) بإستراتيجية التدريس والتقويم:
Fourth: Alignment of Transferable (General) Skills CILOs

| مخرجات المقرر Transferable (General) Skills CILOs | | إستراتيجية التعليم والتعلم Teaching Strategies | إستراتيجية التقويم Assessment strategies |
|--|--|---|--|
| d1- | Transfer information appropriately, verbally, graphically and in writing, using modern information and communication technologies. | <ul style="list-style-type: none"> - Brainstorming - Directed self-study | <ul style="list-style-type: none"> - Reports - Oral presentations |
| d2- | Prepare a review report of the different types of sedimentary rock and their economic importance. | <ul style="list-style-type: none"> - Group assignment - Lab Experiments - Presentation - Project - Seminar | <ul style="list-style-type: none"> - Oral question - Project report evaluation - Evaluation of Group assignment - Evaluation of lab report |

| Course Content | | محتوى المقرر | | | |
|--------------------|--|---|---------------------------------------|--|--|
| Theoretical Aspect | | موضوعات الجانب النظري | | | |
| الرقم Order | الموضوعات الرئيسية/ الوحدات Topic List / Units | الموضوعات الفرعية Sub Topics List | عدد الأسابيع Number of Weeks | الساعات الفعلية Contact Hours | رموز مخرجات التعلم للمقرر (CILOs) |
| 1 | Introduction to the origin of sedimentary Rocks | <ul style="list-style-type: none"> • Definitions of sediment and sedimentary rock. • Sedimentary processes and products • Sedimentary rock cycle • Origin, classification, and occurrence of sedimentary rocks. | 1 | 2 | a1, a2, b1, b2 |
| 2 | Fluids; particle-fluid interaction, flows | <ul style="list-style-type: none"> • Weathering and sedimentary flux: Physical and chemical weathering. | 1 | 2 | a1, a2, b1, c2 |
| | | <ul style="list-style-type: none"> • Fluid flow and sediment transport: Particle entrainment, transport and deposition. • Concept of flow regimes and bed forms, sediment gravity flows | 1 | 2 | a2, b2, c1, c2, |
| 3 | Diagenesis | <ul style="list-style-type: none"> • Concepts of diagenesis • Stages of diagenesis • Burial, Lithification and Diagenesis. | 1 | 2 | a2, c1, d2 |

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|--|--|---|----|----|--------------------------|
| | | •Compaction and cementation. | | | |
| 4 | Sedimentary textures: Sand and sandstones: framework grains; classification, and its Physical processes of sediment granulometry | <ul style="list-style-type: none"> • Sedimentary texture: • Grain size, Udden-Wentworth classification; • Sorting; Shape and roundness; Fabric, packing, porosity and permeability • Compositional maturity, its relationship with provenance | 1 | 2 | a1, a2, b2, c2, d2 |
| 5 | Sedimentary structures | <ul style="list-style-type: none"> • Structure of Sedimentary Rocks: Primary and Secondary sedimentary structures. • Basic concepts of Paleocurrent analysis. | 1 | 2 | a1, a2, b2, c1, c2 |
| 6 | Origin and Classification of varieties sedimentary rocks | Siliciclastic rocks: Classification, Interpreting of siliciclastic sedimentary rocks: Conglomerates, sandstones, mudrocks; clay mineralogy | 1 | 2 | a1, a2, b2, c1, d1 |
| | | Chemical and biochemical rocks: • carbonate deposition, components and classification of limestone and dolomite | 1 | 2 | a1, a2, b2, c1, d1 |
| | | Carbonaceous rocks • Coal as a rock, dispersed organic matter, Other Sedimentary rocks: • Chert and siliceous sediments; Evaporites; Iron-rich sedimentary rocks; Phosphorites | 1 | 2 | a1, a2, b2, c1, d1 |
| | | Volcaniclastic Sediments. • Origin and Classification | 1 | 2 | a1, c1 |
| 7 | Sedimentary Environments • Sedimentary characteristics (lithology, structures, fossils) and characteristic deposits. | • Terrestrial Depositional Environments | 1 | 2 | a1, b1, b2, c1, c2 |
| | | • Transitional Depositional Environments | 1 | 2 | a1, b1, b2, c1, |
| | | • Marine Depositional Environments | 1 | 2 | a1, b1, b2, c1, |
| 8 | The Economic importance of sedimentary rocks | Economic importance of sedimentary geological resources. | 1 | 2 | a1, d1 |
| عدد الأسابيع والساعات الفعلية Number of Weeks /and Contact Hours Per Semester | | | 14 | 28 | |



| الموضوعات العملية (إن وجدت) | | Practical Aspect (if any) | | |
|---|---|------------------------------------|--|--------------------------------------|
| الرقم Order | التجارب العملية/ التمارين / تدريبات Practical / Exercises/Tutorials topics | عدد الأسابيع Number of Weeks | الساعات الفعلية Contact Hours | رموز مخرجات التعلم Course ILOs |
| 1 | <ul style="list-style-type: none"> Observation and documentation the characteristics and composition of sedimentary rocks in hand specimens. The effect of the process of erosion on the characteristics and composition of sediments | 2 | 4 | a1, a2, b1, b2 |
| 2 | <ul style="list-style-type: none"> Physical processes of sediment transport Texture: Grain size: Udden-Wentworth classification; and properties | 2 | 4 | a2, b2, c2 |
| 3 | <ul style="list-style-type: none"> sieve analysis Particle size distribution and Statistical treatment | 2 | 4 | b2, c2 |
| 5 | <ul style="list-style-type: none"> Sedimentary Structures Paleocurrent analysis. | 1 | 2 | c1,c2, d1 |
| 6 | <ul style="list-style-type: none"> Sedimentary Depositional Environments | 2 | 4 | a2, b1,d1 |
| 7 | <ul style="list-style-type: none"> One day field practice observation of outcrops | 1 | 2 | all |
| 8 | <ul style="list-style-type: none"> Petrography of clastic and non-clastic rocks in thin sections | 2 | 4 | c2, d1, d2 |
| اجمالي الأسابيع والساعات الفعلية Number of Weeks /and Contact Hours Per Semester | | 12 | 24 | |

| استراتيجيات التعليم والتعلم | | Teaching Strategies | | |
|--|--|---------------------|--|--|
| <ul style="list-style-type: none"> Lectures Class discussion Brain storm Directed self-study Group assignment Group discussions Lab experiments Presentation Project Seminar | | | | |

| الأنشطة والتكليفات | | Tasks and Assignments | | | |
|--------------------|---------------------------------------|-------------------------------|----------------------------|---------------------------|----------------------------------|
| م No | التكليف/ الواجب Assignments/ Tasks | نوع التكليف (فردى/ تعاونى) | الدرجة المستحقة Mark | أسبوع التنفيذ Week Due | مخرجات التعلم CILOs (symbols) |
| | NA | - | - | - | - |
| Total Score | | إجمالي الدرجة | NA | | |



| Learning Assessment | | | | | |
|---------------------|---|---------------------------|----------------|---|----------------------------------|
| تقييم التعلم | | | | | |
| الرقم No. | أنشطة التقييم Assessment Tasks | أسبوع التقييم Week due | الدرجة Mark | نسبة الدرجة إلى الدرجة Proportion النهائية of Final Assessment | مخرجات التعلم CILOs (symbols) |
| 1 | Lecture attendance and class discussion (theoretical) | Weekly | 5 | 3.3% | all |
| 2 | Quizzes (theoretical) | Bi-weekly basis | 5 | 3.3% | a1,a2,b1,b2,c1,c2 |
| 3 | Mid-Term written exam (theoretical) | Week 7 | 15 | 10% | a1,a2,b1,b2,c1,c2 |
| 4 | Project and Report (theoretical) | Week 10 | 5 | 3.3% | all |
| 5 | Final Exam (theoretical) | Week 16 | 70 | 46.7% | all |
| 6 | Lab attendance and class activities | Weekly | 5 | 3.3% | all |
| 7 | Exercises and report (practical) | Bi-weekly basis | 5 | 3.3% | a1,a2,b1,b2,c1,c2 |
| 8 | Mid-Term Exam (practical) | Week 6 | 10 | 6.6% | a1,a2,b1,b2,c1,c2 |
| 9 | Final Exam (practical) | Week 14 | 30 | 20% | all |
| Total | | الإجمالي | 150 | %100 | %100 |

| Learning Resources | |
|---|---|
| مصادر التعلم | |
| توثق المراجع حسب نظام APA (اسم المؤلف، سنة النشر، اسم الكتاب، دار النشر، بلد النشر). | |
| Required Textbook(s) | المراجع الرئيسية (لا تزيد عن مرجعين) |
| 1. Tucker, M.E. (2017). Sedimentary Petrology. An Introduction to the Origin of Sedimentary Rocks. Blackwell Sci. Pubs., 3rd Ed., 262 pp. | |
| Essential References | المراجع المساندة |
| 1. Blatt, H., Middleton, G.V. and Murray, R.C. (1980) Origin of Sedimentary Rocks. 2nd Ed., Prentice-Hall, New Jersey, 634. | |
| 2. Boggs, S. Jr. (2009). Petrology of sedimentary rocks. Cambridge University Press, 2nd Edition, 600 p. | |
| 3. Guilford, C., MacKenzie, W.S. & Adams, A. E.:(2017) Atlas of sedimentary rocks under the microscope, Longman, Harlow, London eBook Published | |
| Electronic Materials and Web Sites etc. | المصادر الإلكترونية ومواقع الإنترنت |
| https://en.wikipedia.org/wiki | |

| Course Policies | |
|-------------------------------------|--|
| الضوابط والسياسات المتبعة في المقرر | |
| 1 | Tardy - For late in attending the class, the student will be initially notified. If he repeated lateness in attending class, he/she will be considered as absent. - |

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| | | |
|---|--|----------------------------|
| 2 | Exam Attendance/Punctuality | ضوابط الامتحان |
| | - A student should attend the exam on time. He/she is permitted to attend an exam half one hour from exam beginning, after that he/she will not be permitted to take the exam and will be considered as absent in exam. | |
| 3 | Assignments & Projects | التعيينات والمشاريع |
| | - Student has to submit all the assignments/reports for checking on time, mostly one week after given the assignment. | |
| 4 | Cheating | الغش |
| | - In the case of cheating on the exam, the student is considered a failure. It will be referred to a disciplinary council to apply the penalties as stipulated in the Student Affairs Regulations | |
| 6 | Plagiarism | الانتحال |
| | - If the examination committee proofed a plagiarism of a student, It will be referred to a disciplinary council to apply the penalties as stipulated in the Student Affairs Regulation. The Student will be disengaged from the Faculty according to the university roles, and this should be confirmed from the Student Council Affair of the university. | |
| 7 | Other policies | سياسات اخرى |
| | - Mobile phones are not allowed to use during a class lecture. It must be closed; otherwise the student will be asked to leave the lecture room. - Mobile phones are not allowed in hall during the examination. | |



قسم/ برنامج: العلوم الجيولوجية / جيولوجيا البترول
العام الجامعي: 2019-2020م

خطة مقرر: الصخور الرسوبية

Course Plan (Syllabus): Sedimentary petrology

| Information about Faculty Member Responsible for the Course | | | | | | |
|---|--|--|---|--------------|-----------------|-----------------|
| الاسم Name | Prof. AbdulKarim Al-Subbary | | الساعات المكتبية (أسبوعياً) Office Hours | | | |
| المكان ورقم الهاتف Location & Telephone No. | Sana'a University +967 733 63 68 31 | | السبت SAT | الأحد SUN | الاثنين MON | الثلاثاء TUE |
| البريد الإلكتروني E-mail | aalsubbari@yahoo.com | | | | | |
| | | | | | الأربعاء WED | الخميس THU |

| General information about the course | | | | | |
|--------------------------------------|--|--|-------------------|----------------------------------|-------------------|
| 1. | اسم المقرر Course Title | الصخور الرسوبية Sedimentary petrology | | | |
| 2. | رمز المقرر ورقمه Course Code and Number | GEOS322 | | | |
| 3. | الساعات المعتمدة للمقرر Credit Hours | الساعات المعتمدة Credit Hours | | | الإجمالي Total |
| | | محاضرات Lecture | عملي Practical | سمنار/تمارين Seminar/Tutorial | |
| | | 2 | 1 | 0 | 3 |
| 4. | المستوى والفصل الدراسي Study Level and Semester | 3 rd level – 1 st Semester | | | |
| 5. | المتطلبات السابقة للمقرر Pre-requisites | PNR212 | | | |
| 6. | المتطلبات المصاحبة (إن وجدت) Co-requisite | — | | | |
| 7. | البرنامج الذي يدرس له المقرر Program (s) in which the course is offered | Geosciences | | | |
| 8. | لغة تدريس المقرر Language of teaching the course | English/ Arabic | | | |
| 9. | مكان تدريس المقرر Location of teaching the course | Faculty of Petroleum and Natural Resources Buildings | | | |

| Course Description | وصف المقرر |
|---|--|
| This course provide essential concepts for understanding of the processes involved in the genesis of the sedimentary rocks, and outlines on the Identification and description of the various classification schemes for siliciclastic and carbonate rocks; in addition to the weathering processes that alter original properties of primary sediments, sedimentary textures, fabric, composition; sedimentary structures, | يقدم هذا المقرر مفاهيم أساسية لعمليات تكوين الصخور الرسوبية، مع تحديد ووصف مخططات التصنيف المختلفة للصخور الفتاتية والكربونات، بالإضافة إلى عمليات التجوية التي تغير الخصائص الأصلية للرواسب الأولية، والقوام الرسوبي، والنسيج، والتركييب؛ الهياكل الرسوبية، البنيات |

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depositional environments, diagenetic processes and the economic importance of sedimentary geological resources.

الترسيبية، عمليات ما بعد التشاءة والأهمية الاقتصادية للموارد الجيولوجية الرسوبية

| Course Intended Learning Outcomes (CILOs) | | مخرجات تعلم المقرر |
|---|--|---|
| After completing the course, the student will be able to: | | بعد الانتهاء من دراسة المقرر سوف يكون الطالب قادراً على أن: |
| a1. Categorize the different types of sedimentary rocks and recognize its general properties and relation to the source materials. | a1 - يصنف الأنواع المختلفة للصخور الرسوبية ويعرف خصائصها العامة وعلاقتها بمواد المصدر. | |
| a2. Identify and characterize the processes of weathering and alteration, erosion, transport, deposition and diagenesis of sediments. | a2 - يحدد ويوصف عمليات التجوية والتغيير والتعرية والنقل والترسب وانحلال الرواسب. | |
| b1. Distinguish between the depositional environments of the various clastic and non-clastic sedimentary rocks. | b1 - يُميز بين بيئات الترسيب لمختلف الصخور الرسوبية الفتاتية والكربونات | |
| b2. Describe how water, wind, and ice can transport sediments. | b2 - يصف كيف يمكن للماء والرياح والجليد أن ينقل الرواسب. | |
| c1. Use the unique characteristic of sedimentary rocks to identify, classify and describe how sedimentary rocks and its structures form. | c1 - يستخدم الخاصية الفريدة للصخور الرسوبية لتحديد وتصنيف ووصف كيفية تشكل الصخور الرسوبية وهياكلها. | |
| c2. Conduct measurements of the rock and diagnostic properties of sedimentary rocks to recognize and measure grain sizes in samples, photographs and thin sections. | c2 - يجري قياسات للخصائص الصخرية والتشخيصية للصخور الرسوبية للتعرف على أحجام الحبيبات وقياسها في العينات والصور والقطاعات الرقيقة. | |
| d1. Transfer information appropriately, verbally, graphically and in writing, using modern information and communication technologies. | d1 - ينقل المعلومات بشكل مناسب، شفهاً وبيانياً وكتابة، باستخدام تكنولوجيات المعلومات والاتصالات الحديثة. | |
| d2. Prepare a review report of the different types of sedimentary rock and their economic importance. | d2 - يعد تقرير استعراضى لأنواع الصخور الرسوبية المختلفة وأهميتها الاقتصادية | |

| Course Content | | محتوى المقرر | | |
|--------------------|---|---|---------------------|-------------------------------|
| Theoretical Aspect | | خطة تنفيذ الموضوعات النظرية | | |
| الرقم Order | الوحدات (الموضوعات الرئيسية) Units | الموضوعات التفصيلية Sub Topics | الأسبوع Week Due | الساعات الفعالية Con. H |
| 1 | Introduction to the origin of sedimentary Rocks | <ul style="list-style-type: none"> Definitions of sediment and sedimentary rock. Sedimentary processes and products Sedimentary rock cycle Origin, classification, and occurrence of sedimentary rocks. | Week 1 | 2 |
| 2 | Fluids; particle-fluid interaction, flows | <ul style="list-style-type: none"> Weathering and sedimentary flux: Physical and chemical weathering. | Week 2 | 2 |

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Rector of Sana'a University
Prof. Dr. Al Qaseem Mohammed Abas



| | | | | |
|----------|--|---|----------------|----------|
| | | <ul style="list-style-type: none"> Fluid flow and sediment transport: Particle entrainment, transport and deposition. Concept of flow regimes and bed forms, sediment gravity flows. | Week 3 | 2 |
| 3 | Diagenesis | <ul style="list-style-type: none"> Concepts of diagenesis Stages of diagenesis Burial, Lithification and Diagenesis. Compaction and cementation. | Week 4 | 2 |
| 4 | Sedimentary textures: Sand and sandstones: framework grains; classification, and its Physical processes of sediment granulometry | <ul style="list-style-type: none"> Sedimentary texture: Grain size, Udden-Wentworth classification; Sorting; Shape and roundness; Fabric, packing, porosity and permeability Compositional maturity, its relationship with provenance | Week 5 | 2 |
| 5 | Sedimentary structures | <ul style="list-style-type: none"> Structure of Sedimentary Rocks: Primary and Secondary sedimentary structures. Basic concepts of Paleocurrent analysis. | Week 6 | 2 |
| 6 | Mid Term Exam | Written exam | Week 7 | 2 |
| 7 | Origin and Classification of varieties Sedimentary rocks | Siliciclastic rocks: <ul style="list-style-type: none"> Classification, Interpreting of siliciclastic sedimentary rocks: Conglomerates, sandstones, mudrocks ; clay mineralogy;. | Week 8 | 2 |
| | | Chemical and biochemical rocks: <ul style="list-style-type: none"> carbonate deposition, components and classification of limestone and dolomite | Week 9 | 2 |
| | | Carbonaceous rocks <ul style="list-style-type: none"> Coal as a rock, dispersed organic matter, Other Sedimentary rocks: <ul style="list-style-type: none"> Chert and siliceous sediments; Evaporites; Iron-rich sedimentary | Week 10 | 2 |



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| | | rocks; Phosphorites | | |
| | | Volcaniclastic Sediments. • Origin and Classification | Week 11 | 2 |
| 8 | Sedimentary Environments • Sedimentary characteristics (lithology, structures, fossils) and characteristic deposits. | • Terrestrial Depositional Environments | Week 12 | 2 |
| | | • Transitional Depositional Environments | Week 13 | 2 |
| | | • Marine Depositional Environments | Week 14 | 2 |
| 9 | The Economic importance of sedimentary rocks | Economic importance of sedimentary geological resources. | Week 15 | 2 |
| 10 | Final Exam | Written exam | Week 16 | 2 |
| عدد الأسابيع والساعات الفعلية Number of Weeks /and Contact Hours Per Semester | | | 16 | 32 |
| Practical / Training/ Tutorials/ Exercises Aspects خطة تنفيذ موضوعات الجانب العملي | | | | |
| الرقم Order | موضوعات العملي/ المهام / التمارين Practical/Tutorials/ Exercises Aspects | | الأسبوع Week Due | الساعات الفعلية Cont. H |
| 1 | NA | | - | - |
| إجمالي الأسابيع والساعات الفعلية Number of Weeks /and Contact Hours Per Semester | | | NA | NA |
| Course Content محتوى المقرر | | | | |
| Theoretical Aspect خطة تنفيذ الموضوعات النظرية | | | | |
| الرقم Order | الوحدات (الموضوعات الرئيسية) Units | الموضوعات التفصيلية Sub Topics | الأسبوع Week Due | الساعات الفعلية Con. H |
| 1 | Introduction to the origin of sedimentary Rocks Introduction to the origin of sedimentary Rocks | <ul style="list-style-type: none"> Definitions of sediment and sedimentary rock. Sedimentary processes and products Sedimentary rock cycle Origin, classification, and occurrence of sedimentary rocks. | Week 1 | 2 |
| 2 | Fluids; particle-fluid interaction, flows | <ul style="list-style-type: none"> Weathering and sedimentary flux: Physical and chemical weathering. | Week 2 | 2 |



| | | | | |
|----|--|---|----------------|----------|
| | | <ul style="list-style-type: none"> Fluid flow and sediment transport: Particle entrainment, transport and deposition. Concept of flow regimes and bed forms, sediment gravity flows. | Week 3 | 2 |
| 3 | Diagenesis | <ul style="list-style-type: none"> Concepts of diagenesis Stages of diagenesis Burial, Lithification and Diagenesis. Compaction and cementation. | Week 4 | 2 |
| 4 | Sedimentary textures: Sand and sandstones: framework grains; classification, and its Physical processes of sediment granulometry | <ul style="list-style-type: none"> Sedimentary texture: Grain size, Udden-Wentworth classification; Sorting; Shape and roundness; Fabric, packing, porosity and permeability Compositional maturity, its relationship with provenance | Week 5 | 2 |
| 5 | Sedimentary structures | <ul style="list-style-type: none"> Structure of Sedimentary Rocks: Primary and Secondary sedimentary structures. Basic concepts of Paleocurrent analysis. | Week 6 | 2 |
| 6 | Mid Term Exam | Written Exam | Week 7 | 2 |
| 7 | Origin and Classification of varieties of sedimentary rocks | Siliciclastic rocks: <ul style="list-style-type: none"> Classification, Interpreting of siliciclastic sedimentary rocks: Conglomerates, sandstones, mudrocks ; clay mineralogy. | Week 8 | 2 |
| | | Chemical and biochemical rocks: <ul style="list-style-type: none"> carbonate deposition, components and classification of limestone and dolomite | Week 9 | 2 |
| | | Carbonaceous rocks <ul style="list-style-type: none"> Coal as a rock, dispersed organic matter, Other Sedimentary rocks: <ul style="list-style-type: none"> Chert and siliceous sediments; Evaporites; Iron-rich sedimentary rocks; Phosphorites | Week 10 | 2 |
| | | Volcaniclastic Sediments. <ul style="list-style-type: none"> Origin and Classification | Week 11 | 2 |
| 8 | Sedimentary Environments <ul style="list-style-type: none"> Sedimentary characteristics (lithology, structures, fossils) and characteristic deposits. | <ul style="list-style-type: none"> Terrestrial Depositional Environments | Week 12 | 2 |
| | | <ul style="list-style-type: none"> Transitional Depositional Environments | Week 13 | 2 |
| | | <ul style="list-style-type: none"> Marine Depositional Environments | Week 14 | 2 |
| 9 | The Economic importance of sedimentary rocks | Economic importance of sedimentary geological resources. | Week 15 | 2 |
| 10 | Final Exam | Written Exam | Week 16 | 2 |



| | | |
|--|----|----|
| عدد الأسابيع والساعات الفعلية Number of Weeks /and Contact Hours Per Semester | 16 | 32 |
|--|----|----|

Practical / Training/ Tutorials/ Exercises Aspects خطة تنفيذ موضوعات الجانب العملي

| الرقم Order | موضوعات العملي/ المهام / التمارين Practical/Tutorials/ Exercises Aspects | الأسبوع Week Due | الساعات الفعلية Cont. H |
|---|---|---------------------|----------------------------|
| 1 | <ul style="list-style-type: none"> Observation and documentation the characteristics and composition of sedimentary rocks in hand specimens. The effect of the process of erosion on the characteristics and composition of sediments | Week 1, 2 | 4 |
| 2 | <ul style="list-style-type: none"> Physical processes of sediment transport Texture: Grain size: Udden-Wentworth classification; and properties | Week 3, 4 | 4 |
| 3 | <ul style="list-style-type: none"> sieve analysis Particle size distribution and Statistical treatment | Week 5, 6 | 4 |
| 4 | Practical Mid Term Exam | Week 7 | 2 |
| 5 | <ul style="list-style-type: none"> Sedimentary Structures Paleocurrent analysis. | Week 8, | 2 |
| 6 | Sedimentary Depositional Environments | Week 9, 10 | 4 |
| 7 | One day field practice observation of outcrops | Week 11 | 2 |
| 8 | Petrography of clastic and non-clastic rocks in thin sections | Week 12, 13 | 4 |
| 9 | Practical Final Exam | Week 14 | 2 |
| إجمالي الأسابيع والساعات الفعلية Number of Weeks /and Contact Hours Per Semester | | 14 | 28 |

Teaching Strategies

استراتيجيات التعليم والتعلم

- Lectures
- Class discussion
- Directed self-study
- Group discussions
- Group assignment
- Lab experiments
- Presentation
- Project
- Seminar
- Tutorial

Tasks and Assignments

الأنشطة والتكليفات

| م No | التكليف/ الواجب Assignments | نوع التكليف (فردى / تعاوني) | الدرجة المستحقة Mark | أسبوع التنفيذ Week Due |
|------------------------------|--------------------------------|--------------------------------|-------------------------|---------------------------|
| 1 | NA | - | - | - |
| إجمالي الدرجة Total Score | | | NA | |



| Learning Assessment | | تقويم التعلم | | |
|---------------------|---|----------------------------------|----------------|---|
| م No | أساليب التقويم Assessment Method | موعد (أسبوع) التقويم Week Due | الدرجة Mark | الوزن النسبي % Proportion of Final Assessment |
| 1 | Lecture attendance and class discussion (theoretical) | Weekly | 5 | 3.3% |
| 2 | Quizzes (theoretical) | Bi-weekly basis | 5 | 3.3% |
| 3 | Mid-Term written exam (theoretical) | Week 7 | 15 | 10% |
| 4 | Project and Report (theoretical) | Week 10 | 5 | 3.3% |
| 5 | Final Exam (theoretical) | Week 16 | 70 | 46.7% |
| 6 | Lab attendance and class activities | Weekly | 5 | 3.3% |
| 7 | Exercises and report (practical) | Bi-weekly basis | 5 | 3.3% |
| 8 | Mid-Term Exam (practical) | Week 6 | 10 | 6.6% |
| 9 | Final Exam (practical) | Week 14 | 30 | 20% |
| Total | | المجموع | 150 | 100 % |

| Learning Resources | | مصادر التعلم | |
|---|--|---|--|
| توثق المراجع حسب نظام APA (اسم المؤلف، سنة النشر، اسم الكتاب، دار النشر، بلد النشر). | | | |
| Required Textbook(s) | | المراجع الرئيسية (لا تزيد عن مرجعين) | |
| 1. Tucker, M.E. (2017). Sedimentary Petrology. An Introduction to the Origin of Sedimentary Rocks. Blackwell Sci. Pubs., 3rd Ed., 262 pp. | | | |
| Essential References | | المراجع المساندة | |
| 1. Blatt, H., Middleton, G.V. and Murray, R.C. (1980) Origin of Sedimentary Rocks. 2nd Ed., Prentice-Hall, New Jersey, 634. | | | |
| 2. Boggs, S. Jr. (2009). Petrology of sedimentary rocks. Cambridge University Press, 2nd Edition, 600 p. | | | |
| 3. Guilford, C., MacKenzie, W.S. & Adams, A. E.:(2017) Atlas of sedimentary rocks under the microscope, Longman, Harlow, London eBook Published | | | |
| Electronic Materials and Web Sites etc. | | المصادر الإلكترونية ومواقع الإنترنت | |
| https://en.wikipedia.org/wiki | | | |

| Course Policies | | الضوابط والسياسات المتبعة في المقرر | |
|---|------------------------------------|-------------------------------------|--|
| 1 | Class Attendance | حضور الفعاليات التعليمية | |
| - Attendance is compulsory at all scheduled lectures and practical sessions. A student should attend not less than 75 % of total hours of the subject; otherwise he/she will not be able to take the exam and will be considered as exam failure and will be required to retake the course again. | | | |
| 2 | Tardy | الحضور المتأخر | |
| - For late in attending the class, the student will be initially notified. If he repeated lateness in attending class, he/she will be considered as absent. | | | |
| 3 | Exam Attendance/Punctuality | ضوابط الامتحان | |
| - The student should attend the exam on time. He/she is allowed to attend the exam within half an hour from the beginning of the exam, after that if late he/she will not be permitted to take the exam and will be considered as absent. | | | |
| 4 | Assignments & Projects | التعيينات والمشاريع | |



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|---|---|
| | - Student has to submit all the assignments/reports for checking on time, mostly one week after given the assignment. |
| 5 | <p>Cheating الغش</p> <p>- In the case of cheating on the exam, the student is considered a failure. It will be referred to a disciplinary council to apply the penalties as stipulated in the Student Affairs Regulations</p> |
| 6 | <p>Plagiarism الانتحال</p> <p>- If the examination committee proofed a plagiarism of a student, It will be referred to a disciplinary council to apply the penalties as stipulated in the Student Affairs Regulation. The Student will be disengaged from the Faculty according to the university roles, and this should be confirmed from the Student Council Affair of the university.</p> |
| 7 | <p>Other policies سياسات أخرى</p> <p>- Mobile phones are not allowed to use during a class lecture. It must be closed; otherwise the student will be asked to leave the lecture room.</p> <p>- Mobile phones are not allowed in hall during the examination.</p> |