

Ministry of Higher Education and Scientific Research  
Supervision and Scientific Evaluation Authority  
Department of Quality Assurance and Academic Accreditation

## Academic Program Description Form for Colleges and Institutes Academic Year

University: Shatt Al-Arab  
College/Institute: Engineering  
Scientific Department: Oil and Gas engineer

Date of Form Completion: 01/09/2025



Signature  
Name of Head of Department:

Prof. Dr. Emad Hassan Al-Khersan



Signature

Name of Scientific Assistant: Dr. Jawad Kadhim

Reviewed by:  
Quality Assurance and University Performance Division  
Name of Division Director: Dr. Jasem Mohsen Yasser

Signature:



الدكتور  
جاسم محمد ياسر البتات  
Dr. Jasim Al-Battat



أ.م.د. احسان قاسم محمد  
عميد كلية الهندسة

Dean's Approval

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

| Module Information                 |                                |                      |                                                                                                                                                                                                                                                     |                                                                                                                                                          |
|------------------------------------|--------------------------------|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| معلومات المادة الدراسية            |                                |                      |                                                                                                                                                                                                                                                     |                                                                                                                                                          |
| Module Title                       | Stratigraphy and Sedimentation |                      | Module Delivery                                                                                                                                                                                                                                     |                                                                                                                                                          |
| Module Type                        | Core                           |                      | <input checked="" type="checkbox"/> Theory<br><input checked="" type="checkbox"/> Lecture<br><input checked="" type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |                                                                                                                                                          |
| Module Code                        | BEP121                         |                      |                                                                                                                                                                                                                                                     |                                                                                                                                                          |
| ECTS Credits                       | 8                              |                      |                                                                                                                                                                                                                                                     |                                                                                                                                                          |
| SWL (hr/sem)                       | 200                            |                      |                                                                                                                                                                                                                                                     |                                                                                                                                                          |
| Module Level                       | 1                              | Semester of Delivery |                                                                                                                                                                                                                                                     | 2                                                                                                                                                        |
| Administering Department           | Oil and Gas Department         | College              | Engineering College                                                                                                                                                                                                                                 |                                                                                                                                                          |
| Module Leader                      | Dr. Emad Hassan Al-Khersan     |                      | e-mail                                                                                                                                                                                                                                              | <a href="mailto:emad.alkhersan@sa-uc.edu.iq">emad.alkhersan@sa-uc.edu.iq</a> ,<br><a href="mailto:emad.alkhersan@gmail.com">emad.alkhersan@gmail.com</a> |
| Module Leader's Acad. Title        | Professor                      |                      | PhD                                                                                                                                                                                                                                                 |                                                                                                                                                          |
| Module Tutor                       |                                | e-mail               |                                                                                                                                                                                                                                                     |                                                                                                                                                          |
| Peer Reviewer Name                 | None                           | e-mail               |                                                                                                                                                                                                                                                     |                                                                                                                                                          |
| Scientific Committee Approval Date | 01/03/2026                     |                      |                                                                                                                                                                                                                                                     |                                                                                                                                                          |

### Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

|                             |                                                                                                            |                 |  |
|-----------------------------|------------------------------------------------------------------------------------------------------------|-----------------|--|
| <b>Prerequisite module</b>  | General Geology                                                                                            | <b>Semester</b> |  |
| <b>Co-requisites module</b> | Petroleum Geology, Structural Geology, Reservoir Engineering, Drilling Engineering, Well Logs, Geophysics. | <b>Semester</b> |  |

### Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

|                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
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| <b>Module Aims</b><br>أهداف المادة الدراسية | <p>1. Stratigraphy Gives students Techniques For Working Out Earth History, It Integrates Diverse Materials Into A Coherent View Of How The Earth And Its Life Forms Evolved.</p> <p>2. Though Stratigraphy (Literally Writing About Strata) Is Mostly About Working Out The History Of Sedimentary Rocks, In Order To Do This You Also Need To Know The Effects Of Magmatism, Metamorphism, Tectonism, Climatic Change, And Sea-level Changes, And the Effects of Organic Evolution.</p> <p>3. Stratigraphy Integrates Data And Concepts from Many Specialties, And In Practice ends up as a much more comprehensive study than its name Implies.</p> <p>4. Stratigraphy also lets you test ideas on how varying combinations of processes affect the planets through Time. for example, As Evidence For Continental Drift And Changing Climates, Wegener (1915) Used The Presently Separated Positions Of Carboniferous Mosasaurs-bearing And Glacial Sediments,</p> |
|---------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p>Which Were Most Plausibly Explained By An Originally Compact Supercontinent.</p> <p>5. Together, History And Process Let You Work Out How, When, And Why Environments Changed Through Time.</p> <p>6. Stratigraphy, Perhaps Most Importantly, Also Helps You To Understand How Many Economic Materials Formed And Got Distributed In The Way They Did – And So Will Hopefully Help You Find More. For Example, The Wembley Field Is One Of Many Isolated Oil And Gas Reservoirs In The Middle Triassic In Alberta, Canada.</p> <p>7. Finding Out Why The Oil Is There, And Where Other Similar Oil And Gas Fields Are, Requires You To Proceed Logically Through The Various Phases Of Stratigraphy.</p> <p>First, What Are The Actual Oil-bearing Rocks And How Were They Deposited? The Local (Borehole) Sections Mostly Consist Of Porous Sands Alternating With Clays Arranged In Coarsening-upwards Cycles, Deposited By Waves And Currents As Marine Barrier Island Deposits. Second, How Are These Sediments Arranged Spatially And How Old Are They? In The Absence Of Outcrops, Space Correlations Have To Be Worked Out From Borehole Logs And Seismic Sections Which Show The Arrangement And Thickness Of The Strata And Environments And That The Productive Oil And Gas Wells Are In Linear Sand Bodies Of a Particular Type Of Marine Barrier Bar.</p> <p>8. Identify the stratigraphic column of Iraq.</p> <p>9. Understand the basic definitions of stratigraphy and sedimentology.</p> <p>10. Identify the economic formation southern Iraq.</p> |
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|-----------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Module Learning Outcomes</b></p> <p>مخرجات التعلم للمادة الدراسية</p> | <ol style="list-style-type: none"> <li>1. Describe the stratigraphic column of Iraq.</li> <li>2. List the various terms associated with stratigraphy, sedimentology and sequence stratigraphy.</li> <li>3. Summarize what is meant by a basic sequence stratigraphy.</li> <li>4. Discuss the relationships between the stratigraphic units.</li> <li>5. Describe the stratigraphic units.</li> <li>6. Define tectonostratigraphic.</li> <li>7. Identify the sedimentary environments.</li> <li>8. Discuss the stratigraphic relationships.</li> <li>9. Discuss the various mechanism of sedimentation.</li> <li>10. Explain the concepts of sequence stratigraphy.</li> <li>11. Describe the main formations in Iraq.</li> </ol> |
| <p><b>Indicative Contents</b></p> <p>المحتويات الإرشادية</p>                | <p>Indicative content includes the following. Part A – STRATIGRAPHIC PRINCIPLES.</p> <p>Sedimentary rocks important</p> <p>Strata &amp; Stratification</p> <p>Explain stratigraphic Units types.</p> <p>Name the stratigraphic units.</p> <p>Stratigraphy Committee.</p> <p>Tectonics &amp; Tectonostratigraphic of Arabian Plate. Clarification of the stages of development of the Arabian plate during geological time.</p> <p>Using the drawing process to understand the rock sequences in Iraq.</p> <p>The use of software in the task mapping process. Part B – SEQUENCE STRATIGRAPHY CONCEPTS.</p> <p>Understand the basic definitions of sequence stratigraphy</p> <p>Drawing sequence stratigraphic sections.</p>      |

|  |                                                                                |
|--|--------------------------------------------------------------------------------|
|  | Using the concepts of sequences stratigraphy in the investigation of oil traps |
|--|--------------------------------------------------------------------------------|

| <b>Learning and Teaching Strategies</b><br>استراتيجيات التعلم والتعليم |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b>                                                      | <p>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.</p> <p>One of the strategies for this course is to give the student an idea of the stratigraphic column in southern Iraq and the oil-producing rock formations, and Identify the economic formation southern Iraq. In addition to Identify the main oilfields in Iraq.</p> |

| <b>Student Workload (SWL)</b><br>الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا       |     |                                                                          |   |
|--------------------------------------------------------------------------------|-----|--------------------------------------------------------------------------|---|
| <b>Structured SWL (h/sem)</b>                                                  | 109 | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطلاب أسبوعي       | 7 |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطلاب الفصل خلال | 91  | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطلاب أسبوعي | 6 |

|                                                                   |     |
|-------------------------------------------------------------------|-----|
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطالب خلال الفصل | 200 |
|-------------------------------------------------------------------|-----|

| <b>Module Evaluation</b><br>تقييم المادة الدراسية |                        |             |                  |            |                           |
|---------------------------------------------------|------------------------|-------------|------------------|------------|---------------------------|
|                                                   |                        | Time/Number | Weight (Marks)   | Week Due   | Relevant Learning Outcome |
| <b>Formative assessment</b>                       | 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 / <b>Lab.</b> | 1           | 10% (10)         | Continuous | All                       |
|                                                   | Report                 | 1           | 10% (10)         | 13         | LO # 5, 8 and 10          |
| <b>Summative assessment</b>                       | Midterm Exam           | 2 hr        | 10% (10)         | 7          | LO # 1-7                  |
|                                                   | Final Exam             | 2 hr        | 50% (50)         | 16         | All                       |
|                                                   |                        |             | 100% (100 Marks) |            |                           |

| <b>Delivery Plan (Weekly Syllabus)</b><br>المنهاج الاسبوعي النظري |
|-------------------------------------------------------------------|
|-------------------------------------------------------------------|

|         | Material Covered                                                                                        |
|---------|---------------------------------------------------------------------------------------------------------|
| Week 1  | Introduction – Stratigraphy & Sedimentology – Why Bother, Development Of Stratigraphy, Phases Of Study. |
| Week 2  | Sediments and sedimentary rocks.                                                                        |
| Week 3  | Stratigraphic Units.                                                                                    |
| Week 4  | Sedimentary Environments.                                                                               |
| Week 5  | Stratigraphic Relationships                                                                             |
| Week 6  | Transgression & Regression.                                                                             |
| Week 7  | Tectonostratigraphic.                                                                                   |
| Week 8  | <b>Mid-term Exam</b>                                                                                    |
| Week 9  | Sequence Stratigraphy                                                                                   |
| Week 10 | Stratigraphic problem times and places.                                                                 |
| Week 11 | Tectonics and sedimentary basins.                                                                       |
| Week    | Arabian Plate Tectonostratigraphic.                                                                     |

|         |                                                |
|---------|------------------------------------------------|
| 12      |                                                |
| Week 13 | Basin analysis.                                |
| Week 14 | Petroleum System in Iraq.                      |
| Week 15 | Cretaceous Stratigraphic Column Southern Iraq. |
| Week 16 | <b>Preparatory week before the final Exam</b>  |

| <b>Delivery Plan (Weekly Lab. Syllabus)</b><br>المنهاج الاسبوعي للمختبر |                                                                          |
|-------------------------------------------------------------------------|--------------------------------------------------------------------------|
|                                                                         | Material Covered                                                         |
| Week 1                                                                  | Lab 1: Introduction to Subsurface stratigraphic column in southern Iraq. |
| Week 2                                                                  | Lab 2: Subsurface Cretaceous stratigraphic column in southern Iraq.      |
| Week 3                                                                  | Lab 3: The method of drawing the stratigraphic column.                   |
| Week 4                                                                  | Lab 4: The method of drawing the stratigraphic correlation.              |
| Week 5                                                                  | Lab 5: stratigraphic Maps.                                               |
| Week 6                                                                  | Lab 6: The method of drawing the structural contour map.                 |
| Week 7                                                                  | Lab 7: The method of drawing the isothickness map.                       |
| Week 8                                                                  | Lab 8: Stratigraphic software.                                           |

## Learning and Teaching Resources

### مصادر التعلم والتدريس

|                          | Text                                                                                                                                                                                                                                                                                                                                                                                                                                                | Available in the Library? |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
| <b>Required Texts</b>    | Principles of Stratigraphy. Edited by Michael E. Brookfield, 2004 by Blackwell Publishing Ltd.                                                                                                                                                                                                                                                                                                                                                      | Yes                       |
| <b>Recommended Texts</b> | Sedimentology and Stratigraphy. Second Edition, Edited by Gary Nichols. Wiley Blackwell. A John Wiley & Sons, Ltd., Publication.                                                                                                                                                                                                                                                                                                                    | Yes                       |
| <b>Websites</b>          | <a href="https://www.google.com/search?q=sepm+sequence+stratigraphy+web&amp;oq=stratigraphy+web+&amp;gs_lcrp=EgZjaHJvbWUqCagBEAAYFhgeMgYIABBFgDkyCagBEAAYFhge0gEMMjUxMTAxNmowajE1qAIAAsAIA&amp;sourceid=chrome&amp;ie=UTF-8">https://www.google.com/search?q=sepm+sequence+stratigraphy+web&amp;oq=stratigraphy+web+&amp;gs_lcrp=EgZjaHJvbWUqCagBEAAYFhgeMgYIABBFgDkyCagBEAAYFhge0gEMMjUxMTAxNmowajE1qAIAAsAIA&amp;sourceid=chrome&amp;ie=UTF-8</a> |                           |

## Grading Scheme

### مخطط الدرجات

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