







## مواصفات مقرر: جيولوجيا البترول للمهندسين

Course Specification of: Petroleum Geology for Engineers

| G   | المعلومات العامة عن المقرر General information about the course            |   |                           |                                  |                   |                   |
|-----|--|---|---------------------------|----------------------------------|-------------------|-------------------|
| .1  | اسم المقرر<br>Course Title   | جيولوجيا البترول للمهندسين<br>Petroleum Geology for Engineers |                           |                                  |                   |                   |
| .2  | رمز المقرر ورقمه<br>Course Code and Number                                 |   |                           | <b>PNGE 221</b>                  |                   |                   |
|     |  |   | C <mark>redit Ho</mark> u | الساعات المعتمدة Irs             |                   | 11 11             |
| .3  | الساعات المعتمدة للمقرر<br>Credit Hours                                    | محاضرات<br>Lecture  | عملي<br>Practical         | سمنار/تمارین<br>Seminar/Tutorial | تدریب<br>Training | الإجمالي<br>Total |
|     |  | 2   | 1                         | -                                | -                 | 3                 |
| .4  | المستوى والفصل الدراسي<br>Study Level and Semester                         | 2 <sup>nd</sup> level   | , 1 <sup>st</sup> semes   | ster                             |                   |                   |
| .5  | المتطلبات السابقة المقرر (إن وجدت)<br>Pre-requisites (if any)              | PNR 112, PNR 212  |                           |                                  |                   |                   |
| .6  | المتطلبات المصاحبة (إن وجدت)<br>Co-requisites (if any)                     | -   |                           |                                  |                   |                   |
| .7  | البرنامج الذي يدرس له المقرر<br>Program (s) in which the course is offered | Bachelor  | of Petrol                 | eum and Natural                  | Gas Engin         | eering            |
| .8  | لغة تدريس المقرر<br>Language of teaching the course                        | English/  | Arabic                    |                                  |                   |                   |
| .9  | نظام الدراسة<br>Study System   | Academi   | ic year of                | two semesters                    |                   |                   |
| .10 | مكان تدريس المقرر<br>Location of teaching the course                       | Faculty of Petroleum and Natural Resources                    |                           |                                  |                   |                   |
| .11 | اسم معد(و) مواصفات المقرر<br>Prepared by                                   | Assoc.Prof. Adel Al-Matary                                    |                           |                                  |                   |                   |
| .12 | تاریخ اعتماد مجلس الجامعة<br>Date of Approval                              | 2020  |                           |                                  |                   |                   |

| وصف المقرر Course Description                |                       |
|--|-----------------------|
| وصف المقرر ر بالإنجليزية                     | وصف المقرر ر بالعربية |
| This is a basic course in petroleum geology: |                       |
| The students will be exposed to different    |                       |
| source, reservoir and cap-rocks,             |                       |
| characterization of reservoir rocks,         |                       |
| classification of reservoir pore space,      |                       |

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Dean of the Faculty Assoc.Prof. Bassim AlKhirbash









permeability, migration and entrapment, temperature-pressure conditions for the generation of oil and gas from sediments.

| C     | ourse Intended Learning Outcome   | مخرجات تعلم المقرر (CILOs)                                 |
|-------|---|--|
| After | completing the course, the student will be able to:   | بعد الانتهاء من دراسة المقرر سوف يكون الطالب قادرا على أن: |
| a1.   | Describe the nature of petroleum, and describe the chemical composition of liquid and gaseous petroleum.                                    | - a1   |
| a2.   | Gain knowledge of how and why fluid hydrocarbons migrate from a source rock to reservoir rock, entrapment and accumulation of hydrocarbons. | - a2   |
| b1.   | Identify different source rocks from which hydrocarbons are generated.  | -b1  |
| b2.   | Interpret maps and reservoir traps  | - b2   |
| c1.   | Compute the analysis of well logs, cross-sections and correlation.  | - c1   |
| c2.   | Do tectonic classification, stratigraphy evaluation and hydrocarbon accumulation of some Basin in Yemen                                     | - c2   |
| d1.   | Collaborate effectively within a multidisciplinary team.  | - d1   |
| d2.   | Acquire entrepreneurial skills to Prepare technical petroleum reports.  | - d2   |

| Alignn    | مواءمة 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  |       | مخرجات التعلم المقصودة من البرنامج          |  |  |
|           | (Course Intended Learning Outcomes)   | (Prog | gram Intended Learning Outcomes)            |  |  |
|           |   | (     | (تكتب جميع مخرجات البرنامج كما هي رمزا ونصا |  |  |
| a1        | Describe the nature of petroleum, and describe the chemical composition of liquid and gaseous petroleum.  | A1    |   |  |  |
| a2        | Gain knowledge of how and why fluid hydrocarbons migrate from a source rock to reservoir rock, entrapment and accumulation of hydrocarbons.               | A2    |   |  |  |
| b1        | Identify different source rocks from which hydrocarbons are generated.  | B2    |   |  |  |
| <b>b2</b> | Interpret maps and reservoir traps  | B2    |   |  |  |
| c1        | Compute the analysis of well logs, cross-sections and correlation.  | C2    |   |  |  |

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| c2 | Do tectonic classification, stratigraphy evaluation and hydrocarbon accumulation of some Basin in Yemen | С3 |  |
|----|---|----|--|
| d1 | Collaborate effectively within a multidisciplinary team.  | D1 |  |
| d2 | Acquire entrepreneurial skills to Prepare technical petroleum reports.                                  | D3 |  |

|             | يم والتعلم والتقويم   | ت التعلم                                   | ت التعلم باستراتيجيا،           | مواءمة مخرجان                    |
|-------------|---|--|---------------------------------|----------------------------------|
| Aligni      | ment of CILOs to Teaching and Assessment Strate                                     | egies                                      |                                 |                                  |
|             | ***   |  |                                 |                                  |
|             | م) باستراتيجية التعليم والتعلم والتقويم:  | ، والفهد                                   | ت تعلم المقرر (المعارف          | اولا: مواءمه مخرجا               |
| First:      | Alignment of Knowledge and Understanding C  | CILOs                                      |                                 |                                  |
|             | مخرجات المقرر/ المعرفة والفهم   |  | استراتيجية التعليم              | استراتيجية التقويم               |
|             | Knowledge and Understanding CILOs   |  | والتعلم                         | Assessment                       |
|             | 1=  |  | Teaching Strategies             | Strategies                       |
| a1 -        | Describe the nature of petroleum, and descrict chemical composition of liquid and g | be the aseous                              | Interactive Lectures Discussion | Examinations,<br>Assignments,    |
|             | petroleum.  | ,450045                                    | Discussion                      | Oral presentations               |
| a2 -        | Gain knowledge of how and why fluid hydroc  | arbons                                     |                                 | -                                |
|             | migrate from a source rock to reservoir rock, entrapment and accumulati             | on of                                      |                                 |                                  |
|             | hydrocarbons.   | OII OI                                     |                                 |                                  |
|             |   |  |                                 |                                  |
|             | ة) باستراتيجية التدريس والتقويم:  | ن الذهني                                   | ت تعلم المقرر (المهاران         | ثانيا: مواءمة مخرجان             |
| Secon       | d: Alignment of Intellectual Skills CILOs   |  |                                 |                                  |
|             | مخرجات المقرر/ المهارات الذهنية   |  | استراتيجية التعليم والتعلم      | استراتيجية التقويم               |
|             | Intellectual Skills CILOs   |  | <b>Teaching Strategies</b>      | Assessment<br>Strategies         |
| b1 -        | 3   | which                                      | Discussion                      | Essay test,                      |
|             | hydrocarbons are generated.   |  | Demonstration Brain storm       | Assignments, Oral presentations. |
| <b>b2</b> - | Interpret maps and reservoir traps  |  | Problem solving                 | Oral presentations.              |
|             |   |  |                                 |                                  |
|             | ية والعملية) باستراتيجية التدريس والتقويم:  | ت المهنب                                   | ت تعلم المقرر (المهاراه         | ثالثا: مواءمة مخرجا              |
| Third       | l: Alignment of Professional and Practical S  | Skills C                                   | CILOs                           |                                  |
|             | مخرجات المقرر/ المهارات المهنية والعملية  | علم  | استراتيجية التعليم والت         | استراتيجية التقويم               |
|             | Professional and Practical Skills CILOs   | Т  | eaching Strategies              | Assessment                       |
|             |   | m : :                                      | 1 0 1 1                         | Strategies                       |
| с1-         | Compute the analysis of well logs, cross-sections and correlation.                  | Tutorials & practical classes, case study, |                                 | Achievement tests Chart Drawing  |
| <b>c2</b> - | Do tectonic classification, stratigraphy  |  | iter based teaching             | practical exams                  |
|             | evaluation and hydrocarbon accumulation of  |  |                                 |                                  |
|             | some Basin in Yemen   |  |                                 |                                  |

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| رابعا: مواءمة مخرجات تعلم المقرر (المهارات العامة) باستراتيجية التدريس والتقويم: Fourth: Alignment of Transferable (General) Skills CILOs |  |   |  |  |  |
|---|--|---|--|--|--|
|   | مخرجات المقرر<br>Transferable (General) Skills CILOs                   | استراتيجية التعليم والتعلم<br>Teaching Strategies | استراتيجية التقويم<br>Assessment<br>Strategies |  |  |
| d1-   | Collaborate effectively within a multidisciplinary team.               | Small group working<br>Student-led Seminars       | Achievement tests<br>Team working              |  |  |
| d2-   | Acquire entrepreneurial skills to Prepare technical petroleum reports. | Case Study Method                                 |  |  |  |

| Co             | محتوى المقرر Course Content   |  |                                       |  |  |  |  |
|----------------|---|--|---------------------------------------|--|--|--|--|
| (ID)           |   |  |                                       |  |  |  |  |
| الرقم<br>Order | بانب النظري etical Aspect<br>الموضوعات الرئيسة/ الوحدات<br>Topic List / Units | موصوعات الفرعية<br>الموضوعات الفرعية<br>Sub Topics List  | عدد<br>الأسابيع<br>Number<br>of Weeks | الساعات<br>الفعلية<br>Contact<br>Hours | رموز<br>مخرجات<br>التعلم للمقرر<br>(CILOs) |  |  |
| 1              | The History and Nature of Petroleum   | First use Petroleum products demand  | 1                                     | 2                                      | a1 a2                                      |  |  |
| 2              | Occurrence and origin of petroleum  | Organic theories Inorganic theories  | 1                                     | 2                                      | a1 a2                                      |  |  |
| 3              | Chemical Composition of Petroleum,  | Properties of Liquid Petroleum;<br>Gaseous Petroleum (natural<br>gas), and Gas Law   | 1                                     | 2                                      | a1 a2<br>c2.1                              |  |  |
| 4              | Petroleum System  | Requirements<br>for Commercial Oil<br>Accumulations  | 1                                     | 2                                      | a1 a2<br>b2.1                              |  |  |
| 5              | Source rock   | -Organic matter type -Kerogen types -Evaluation methods  | 2                                     | 4                                      | a1 a2                                      |  |  |
|                | Reservoir rock  | -Basic Rock Properties<br>-Porosity, and Permeability<br>(Darcy's Law)   | 2                                     | 4                                      | a2 b2.1<br>b2.2<br>c2.2 d3                 |  |  |
|                | Reservoir pore spaces   | -Reservoir contents of Fluids<br>and Gas (Saturation)<br>-Dimensional Analysis of<br>Permeability,<br>Dimensional Analysis of<br>Fluid Viscosity | 2                                     | 4                                      | a2 b2.1<br>b2.2<br>c2.2 d3                 |  |  |
|                | Subsurface<br>Environments  | Subsurface water<br>Subsurface pressures   | 1                                     | 2                                      | a1   |  |  |

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|  | Subsurface temperature               |    |    |                    |
|--|--------------------------------------|----|----|--------------------|
| Entrapments  | Traps types                          | 1  | 2  | a2 b2.1<br>c2.2    |
| Petroleum Exploration<br>Methods   | Gravity and Seismic methods overview | 1  | 2  | a2 c2.1<br>c2.2 d3 |
| Rig Components   | Rig systems                          | 1  | 2  | a1, a2,<br>c1, c2  |
| عدد الأسابيع والساعات الفعلية<br>Number of Weeks /and Contact Hours Per Semester |                                      | 14 | 28 |                    |

| Prac           | Practical Aspect (if any) (إن وجدت العملية (إن وجدت)                                |                                    |  |                                      |  |  |
|----------------|---|------------------------------------|--|--------------------------------------|--|--|
| الرقم<br>Order | التجارب العملية/ التمارين / تدريبات<br>Practical / Exercises/ Tutorials topics      | عدد الأسابيع<br>Number of<br>Weeks | الساعات<br>الفعلية<br>Contact<br>Hours | رموز مخرجات<br>التعلم<br>Course ILOs |  |  |
| 1              | LAB 1: PETROLEUM INORGANIC ORIGIN   | 1                                  | 2                                      | a1,b1,c1                             |  |  |
| 2              | LAB2: GEOCHEMISTRY AND OIL CHARACTERIZATION   | 1                                  | 2                                      | b1,c2                                |  |  |
| 3              | LAB 3: CLASSIFICATION OF CRUDE OILS   | 1                                  | 2                                      | b1,c1                                |  |  |
| 4              | LAB 4: SOURCE ROCK EVALUATIONS  | 1                                  | 2                                      | a2,c2                                |  |  |
| 5              | LAB 5: USE OF BORE-HOLE LOGS IN IDENTIFYING PETROLEUM SOURCE ROCKS                  | 1                                  | 2                                      | b2,c1                                |  |  |
| 6              | LAB 6: OIL MIGRATION  | 1                                  | 2                                      | a2,b2                                |  |  |
| 7              | LAB 7: RESERVOIR MAPPING  | 1                                  | 2                                      | b1,b2,c2                             |  |  |
| 8              | LAB 8: RESERVOIR PROPERTIES AND RESERVE ESTIMATE                                    | 1                                  | 2                                      | b1,b2,c1,c2                          |  |  |
| 9              | LAB 9: DEPTH MAP OF THE RESERVOIR   | 1                                  | 2                                      | b1,b2,c1,c2                          |  |  |
| 10             | LAB 10: SUBSURFACE CROSS SECTION  | 2                                  | 4                                      | b1,b2,c1,c2                          |  |  |
| 11             | LAB 11: Correlation of Intertonguing Deposits                                       | 2                                  | 4                                      | b1,b2,c1,c2                          |  |  |
|                | اجمالي الأسابيع والساعات الفعلية<br>Number of Weeks /and Contact Hours Per Semester | 13                                 | 26                                     |                                      |  |  |

## استراتيجيات التعليم والتعلم Teaching Strategies

- Interactive Lectures
- Discussion
- Demonstration
- Brain storm
- Problem solving
- Computer based teaching
- Small group working
- Student-led Seminars

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#### Case study

|         | Tasks and Assignments الأنشطة والتكليفات |                               |                            |                              |                                    |  |
|---------|--|-------------------------------|----------------------------|------------------------------|------------------------------------|--|
| م<br>No | التكليف/ الواجب<br>Assignments/ Tasks    | نوع التكليف<br>(فردي/ تعاوني) | الدرجة<br>المستحقة<br>Mark | أسبوع<br>التنفيذ<br>Week Due | خرجات التعلم<br>CILOs<br>(symbols) |  |
| 1       | n/a                                      |                               |                            |                              |                                    |  |
|         | إجمالي الدرجة Total Score                |                               |                            |                              |                                    |  |

|              | Learning Assessment تقييم التعلم  |                          |                |  |                                  |
|--------------|-----------------------------------|--------------------------|----------------|--|----------------------------------|
| الرقم<br>No. | أنشطة التقييم<br>Assessment Tasks | أسوع التقييم<br>Week due | الدرجة<br>Mark | نسبة الدرجة إلى<br>الدرجة النهانية<br>Proportion of<br>Final<br>Assessment | مخرجات التعلم<br>CILOs (symbols) |
| 1            | Lab Exercises                     | Weekly                   | 20             | 13.4%  | b1, b2,c1,c2                     |
| 2            | Participation                     | Weekly                   | 10             | 6.7%   | a1,a2,c1,c2,d1                   |
| 3            | Quizzes                           | End of a                 | 10             | 6.7%   | a1,a2,b1,b2,                     |
| 4            | Mid-Term written exam             | Week 7                   | 20             | 13.3%  | a1,a2,b1,b2,                     |
| 5            | Final lab Exam                    | Week 7                   | 20             | 13.3%  | b1,b2,c1,c2,d1                   |
| 6            | Final Exam (theoretical)          | Week 16                  | 70             | 46.6%  | all                              |
|              | الإجمالي Total                    | 150                      | 100.00%        |  |                                  |

### مصادر التعلم Learning Resources

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

- 1. Saied, M; Al-Matary, A; Gashan, M. (2015) The Black Gold, Origin, occurrence and geochemistry of Petroleum. AlMajd Publications, Sana'a, Yemen.
- 2. Richard C. Selley, (2015) Elements of Petroleum Geology. 3<sup>rd.</sup> Edition Elsevier Academic Press, 520p.

#### المراجع المساندة Essential References

- 1- Geology of Petroleum, A·I· Levorsen,  $2^{nd}$  Edition· CBS, Publishers, **2006**·2- Amyx, J· W·. Bass.·
- 2- Unconventional Petroleum Geology, Caineng Zou et al., Elsevier, 2013.

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

www.spe.com

http://link.springer.com

http://www.sciencedirect.com

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









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قسم/ برنامج: هندسة النفط والغاز الطبيعي

العام الجامعي: 2019- 2020م

## خطة مقرر: جيولوجيا البترول للمهندسين

Course Plan (Syllabus): Petroleum Geology for Engineers

| Information about Faculty Member Responsible for the Course معلومات عن أستاذ المقرر |                            |              |                                 |                    |                 |                 |               |
|---|----------------------------|--------------|---------------------------------|--------------------|-----------------|-----------------|---------------|
| الاسم<br>Name   | Assoc.Prof. Adel Al-Matary |              | مكتبية <sub>(</sub><br>ffice Ho | الساعات ال<br>ours |                 |                 |               |
| المكان ورقم الهاتف<br>Location &Telephone No.                                       | 770770769                  | السبت<br>SAT | الأحد<br>SUN                    | الاثنين<br>MON     | الثلاثاء<br>TUE | الأربعاء<br>WED | الخميس<br>THU |
| البريد الإلكتروني<br>E-mail   | a.almatary@su.edu.ye       |              |                                 |                    |                 |                 |               |

| (  | معلومات عامة عن المقرر General information about the course                |                       |   |                                  |                   |                   |
|----|--|-----------------------|---|----------------------------------|-------------------|-------------------|
| .1 | اسم المقرر<br>Course Title   | Pe                    | جيولوجيا البترول للمهندسين<br>Petroleum Geology for Engineers |                                  |                   |                   |
| .2 | رمز المقرر ورقمه<br>Course Code and Number                                 |                       |   | PNGE 221                         |                   |                   |
|    |  |                       | Credit Hou  | لساعات المعتمدة Irs              | i)                | 11 -2 21          |
| .3 | الساعات المعتمدة للمقرر<br>Credit Hours                                    | محاضرات<br>Lecture    | عملي<br>Practical   | سمنار/تمارین<br>Seminar/Tutorial | تدریب<br>Training | الإجمالي<br>Total |
|    |  | 2                     | 1   | -                                | -                 | 3                 |
| .4 | المستوى والفصل الدراسي<br>Study Level and Semester                         | 2 <sup>nd</sup> level | l, 1 <sup>st</sup> seme                                       | ester                            |                   |                   |
| .5 | المتطلبات السابقة للمقرر Pre-requisites                                    | PNR 11                | 2, PNR 21   | 12                               |                   |                   |
| .6 | المتطلبات المصاحبة (إن وجدت)Co-requisite                                   | -                     |   |                                  |                   |                   |
| .7 | البرنامج الذي يدرس له المقرر<br>Program (s) in which the course is offered | Bachelor              | of Petrol   | eum and Natur                    | al Gas En         | gineering         |
| .8 | لغة تدريس المقرر<br>Language of teaching the course                        | English/              | Arabic  |                                  |                   |                   |
| .9 | مكان تدريس المقرر<br>Location of teaching the course                       | Faculty               | of Petrole  | um and Natural                   | l Resource        | es                |

| وصف المقرر Course Description  |  |
|--|--|
| This is a basic course in petroleum geology. The students will be exposed to different source, reservoir and cap-rocks, characterization of reservoir rocks, classification of reservoir pore space, permeability, migration and entrapment, temperature-pressure conditions for the generation of oil and gas from sediments. |  |

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| Course Intended Learning Outcomes   | s (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: |
| <b>a1</b> . Describe the nature of petroleum, and describe the chemical composition of liquid and gaseous petroleum.                                    | - a1   |
| <b>a2</b> . Gain knowledge of how and why fluid hydrocarbons migrate from a source rock to reservoir rock, entrapment and accumulation of hydrocarbons. | - a2   |
| <b>b1</b> . Identify different source rocks from which hydrocarbons are generated.  | -b1  |
| <b>b2</b> . Interpret maps and reservoir traps  | - b2   |
| <b>c1</b> . Compute the analysis of well logs, cross-sections and correlation.  | - c1   |
| c2. Do tectonic classification, stratigraphy evaluation and hydrocarbon accumulation of some Basin in Yemen   | - c2   |
| <b>d1</b> . Collaborate effectively within a multidisciplinary team.  | - d1   |
| <b>d2</b> . Acquire entrepreneurial skills to Prepare technical petroleum reports.  | - d2   |

|                        | محتوى المقرر Course Content             |   |                        |                              |  |
|------------------------|---|---|------------------------|------------------------------|--|
|                        |   |   |                        |                              |  |
| The                    | oretical Aspect النظرية                 | خطة تنفيذ الموضوعات   |                        |                              |  |
| ا <b>لرقم</b><br>Order | الوحدات<br>(الموضوعات الرئيسة)<br>Units | الموضوعات التفصيلية<br>Sub Topics   | الأسبوع<br>Week<br>Due | الساعات<br>الفعلية<br>Con. H |  |
| 1                      | The History and Nature of Petroleum     | First use<br>Petroleum products demand  | 1                      | 2                            |  |
|                        | Occurrence and origin of petroleum      | Organic theories Inorganic theories   | 1                      | 2                            |  |
|                        | Chemical Composition of Petroleum,      | Properties of Liquid Petroleum;<br>Gaseous Petroleum (natural gas), and Gas Law | 1                      | 2                            |  |
|                        | Petroleum System                        | Requirements<br>for Commercial Oil Accumulations                                | 1                      | 2                            |  |
|                        | Source rock                             | -Organic matter type -Kerogen types -Evaluation methods                         | 2                      | 4                            |  |
|                        | Midterm Exam                            |   | 1                      | 2                            |  |

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Dean of the Faculty Assoc.Prof. Bassim AlKhirbash









| Reservoir rock   | -Basic Rock Properties<br>-Porosity, and Permeability (Darcy's Law)  | 2 | 4  |
|--|--|---|----|
| Reservoir pore spaces  | -Reservoir contents of Fluids and Gas<br>(Saturation)<br>-Dimensional Analysis of Permeability,<br>Dimensional Analysis of Fluid Viscosity | 2 | 4  |
| Subsurface<br>Environments   | Subsurface water Subsurface pressures Subsurface temperature   | 1 | 2  |
| Entrapments  | Traps types  | 1 | 2  |
| Petroleum Exploration<br>Methods   | Gravity and Seismic methods overview   | 1 | 2  |
| Rig Components   | Rig systems  | 1 | 2  |
| Final Exam   |  | 1 | 2  |
| عدد الأسابيع والساعات الفعلية<br>Number of Weeks /and Contact Hours Per Semester |  |   | 32 |

| Prac                   | خطة تنفيذ موضوعات الجانب العملي Practical / Training/ Tutorials/ Exercises Aspects  |                     |                            |  |  |
|------------------------|---|---------------------|----------------------------|--|--|
| ا <b>لرقم</b><br>Order | موضوعات العملي/ المهام / التمارين<br>Practical/ Tutorials/ Exercises Aspects        | الأسبوع<br>Week Due | الساعات الفعلية<br>Cont. H |  |  |
| 1                      | LAB 1: PETROLEUM INORGANIC ORIGIN   | 1                   | 2                          |  |  |
| 2                      | LAB2: GEOCHEMISTRY AND OIL CHARACTERIZATION   | 1                   | 2                          |  |  |
| 3                      | LAB 3: CLASSIFICATION OF CRUDE OILS   | 1                   | 2                          |  |  |
| 4                      | LAB 4: SOURCE ROCK EVALUATIONS  | 1                   | 2                          |  |  |
| 5                      | LAB 5: USE OF BORE-HOLE LOGS IN IDENTIFYING PETROLEUM SOURCE ROCKS                  | 1                   | 2                          |  |  |
| 6                      | LAB 6: OIL MIGRATION  | 1                   | 2                          |  |  |
| 7                      | Mid-lab exam  | 1                   | 2                          |  |  |
| 8                      | LAB 7: RESERVOIR MAPPING  | 1                   | 2                          |  |  |
| 9                      | LAB 8: RESERVOIR PROPERTIES AND RESERVE ESTIMATE                                    | 1                   | 2                          |  |  |
| 10                     | LAB 9: DEPTH MAP OF THE RESERVOIR   | 1                   | 2                          |  |  |
| 11                     | LAB 10: SUBSURFACE CROSS SECTION  | 2                   | 4                          |  |  |
| 12                     | LAB 11: Correlation of Intertonguing Deposits                                       | 2                   | 4                          |  |  |
| 13                     | Final lab exam  | 1                   | 2                          |  |  |
|                        | اجمالي الأسابيع والساعات الفعلية<br>Number of Weeks /and Contact Hours Per Semester | 15                  | 30                         |  |  |

## استراتيجيات التعليم والتعلم Teaching Strategies

- Interactive Lectures
- Discussion

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الجمهورية اليمنية وزارة التطيم العالي والبحث العلمي جـــــامعة صــــــــنعاء كلية البترول والموارد الطبيعية

- Demonstration
- Brain storm
- Problem solving
- Case study,
- Computer based teaching
- Small group working
- Student-led Seminars

| Γ       | Tasks and Assignments الأنشطة والتكليفات |                               |                         |                           |  |
|---------|--|-------------------------------|-------------------------|---------------------------|--|
| م<br>No | التكليف/ الواجب<br>Assignments           | نوع التكليف<br>(فردي/ تعاوني) | الدرجة المستحقة<br>Mark | أسبوع التنفيذ<br>Week Due |  |
| 1       | n/a                                      |                               |                         |                           |  |
|         | إجمالي الدرجة Total Score                | _                             | 15/150<br>10/ 100       |                           |  |

| ]       | Learning Assessment تقويم التعلم    |                                  |                |  |  |  |
|---------|-------------------------------------|----------------------------------|----------------|--|--|--|
|         |                                     |                                  | 1              |  |  |  |
| ۶<br>No | أساليب التقويم<br>Assessment Method | موعد (أسبوع) التقويم<br>Week Due | الدرجة<br>Mark | الوزن النسبي%<br>Proportion of Final<br>Assessment |  |  |
| 1       | Lab Exercises                       | Weekly                           | 20             | 13.4%  |  |  |
| 2       | Participation                       | Weekly                           | 10             | 6.7%   |  |  |
| 3       | Quizzes                             | End of a topic                   | 10             | 6.7%   |  |  |
| 4       | Mid-Term written exam               | Week 7                           | 20             | 13.3%  |  |  |
| 5       | Final lab Exam                      | Week 7                           | 20             | 13.3%  |  |  |
| 6       | Final Exam (theoretical)            | Week 16                          | 70             | 46.6%  |  |  |
|         | المجموع Total                       |                                  |                | 100.00%  |  |  |

### مصادر التعلم Learning Resources

### Required Textbook(s) (ال تزيد عن مرجعين (لا تزيد عن مرجعين)

- 1. Saied, M; Al-Matary, A; Gashan, M. (2015) The Black Gold, Origin, occurrence and geochemistry of Petroleum. AlMajd Publications, Sana'a, Yemen.
- 2. Richard C. Selley, (2015) Elements of Petroleum Geology. 3<sup>rd.</sup> Edition Elsevier Academic Press, 520p.

#### المراجع المساندة Essential References

- 1- Geology of Petroleum, A·I· Levorsen,  $2^{nd}$  Edition· CBS, Publishers, **2006**·2- Amyx, J· W·, Bass,·
- 2- Unconventional Petroleum Geology, Caineng Zou et al., Elsevier, 2013.

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

www.spe.com

http://link.springer.com

http://www.sciencedirect.com

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