

Oil and Gas Engineering Program Specifications

Introduction:

In the Oil and Gas Engineering program, the student is educated in the principles, procedures and practices of drilling, formation evaluation, reservoir studies, production, environmental protection, and economic analysis.

1. Program Identification and General Information:

| | |
|---|--|
| Scientific name of the program: | Oil and Gas Engineering |
| Total credit hours required to award the degree | 153 |
| Number of years needed for completion of the program: | 4 years [8 semesters] |
| The body responsible for granting the degree: | Emirates International University |
| The body responsible for the program: | Department of Oil and Gas Engineering, Faculty of Engineering and IT |
| Award granted on completion of the program: | Bachelor Degree in Oil and Gas Engineering |
| Study system: | Semester wise |
| Study Language of the Program: | English |
| Entry requirements: | High School Certificate – Scientific Section. |
| Departments participating in the program: | All department of faculty of Engineering and Information Technology Faculty of science- department of mathematics, department of physics. Faculty of literature, Department of English language, department of Arabic language, department of Islamic studies. |
| Starting year of the program: | 2014/2015 |
| Qualification required | High Secondary certificate- scientific section |
| Study methods in the program: | Class attendance (minimum 75%). |
| Study Language | English |
| Location of Delivery: | Faculty of Engineering and IT, Emirates International University. |
| The program resources: | Emirates International University. |
| Minimum grade requirements: | As per the Ministry of Higher education and Scientific Research Regulations. |
| Other admission requirements: | According to the University Rules and Regulations. |
| Date of program development: | May 2019. |
| Prepared by : | Program Development Committee |
| Responsible Faculty: | Dr. Ibrahim Ali Farea Saeed |

2. Overview:

- The Oil and Gas program is offered in response to the growing and increasing demands from petroleum industry for graduates of petroleum engineers, who are equipped with theoretical and practical experience to participate in developing the Oil and Gas sector. It focuses on integrating Drilling, Reservoir and production Engineering with the needs of petroleum industry.

3. University Vision, Mission and Goals:

الرؤية:

أن تصبح الجامعة الإماراتية الدولية – اليمن إحدى الجامعات الرائدة وطنياً والمتميزة إقليمياً.

الرسالة:

تسعى الجامعة الإماراتية الدولية – اليمن إلى تقديم خدمة تعليمية وبحثية متميزة تسهم في تلبية احتياجات سوق العمل الوطني والإقليمي من خلال موارد بشرية مؤهلة، وبرامج أكاديمية مجودة، وبحث علمي موجه لإنتاج المعرفة وتطبيقاتها، وتوفير بيئة جامعية داعمة، وشراكة مجتمعية فاعلة.

الأهداف:

1. تحسين نظم الحوكمة والإدارة واستكمال شواغر الهيكل التنظيمي، وترسيخ اللامركزية وانتهاج مبادئ الجودة والشفافية.
2. التوسع في البنى التحتية، وتنمية الموارد الذاتية لتحقيق رؤية ورسالة الجامعة وأهدافها الاستراتيجية.
3. تحسين جودة ونوعية البرامج الأكاديمية لتلبية احتياجات التنمية .
4. تعزيز قيم التنمية المهنية واستثمار الموارد البشرية على أساس مهني وفقاً للإطار الاستراتيجي للجامعة .
5. تطوير البنية الجامعية الداعمة للتعليم والتعلم وبما يحقق الكفايات المهنية للخريج .
6. بناء قدرات البحث العلمي وتوجيهه على أساس من التخطيط المرتبط بأهداف التنمية .
7. بناء شراكة حقيقية فاعلة مع المجتمع المحلي والجامعات الأخرى وسوق العمل الوطني والدولي.

4. Faculty of Engineering and IT Vision, Mission and Goals:

أ. الرؤية:

الريادة والتميز في التعليم الهندسي والتكنولوجي بما يلبي احتياجات التنمية الشاملة ويحقق المنافسة محلياً وإقليمياً.

ب. الرسالة:

تقديم تعليم هندسي وتكنولوجي متميز يسهم في تلبية احتياجات سوق العمل المحلي والإقليمي ومتطلبات التنمية من خلال موارد بشرية مؤهلة وبرامج أكاديمية معتمدة وبحث علمي موجه لإنتاج المعرفة وتطبيقاتها وبيئة جامعية تدعم الابداع والابتكار المعرفي وشراكة مجتمعية فاعلة.

ج. القيم:

قيم كلية الهندسة وتكنولوجيا المعلومات – الجامعة الإماراتية الدولية:

الجودة، التميز، الالتزام بالمعايير الأخلاقية والمهنية، الولاء المؤسسي، العمل الجماعي، الشراكة.

د. الاهداف الاستراتيجية (الغايات):**التوجه الأول:**

تحسين نظم الحوكمة والإدارة واستكمال شواغر الهيكل التنظيمي وتطوير البناء التنظيمي في الكلية.

التوجه الثاني:

تطوير البنية التحتية للكلية، وفقاً لمعايير الاعتماد الأكاديمي وبما يحقق رؤية ورسالة الكلية وأهدافها الاستراتيجية.

التوجه الثالث:

التحسين المستمر في جودة ونوعية البرامج الأكاديمية لتلبية احتياجات التنمية.

التوجه الرابع:

تعزيز قيم التنمية المهنية واستثمار الموارد البشرية في الكلية على أساس مهني وفقاً للإطار الاستراتيجي للكلية.

التوجه الخامس:

خلق توفير بيئة جامعية داعمة للتعليم والتعلم والتفكير العلمي الإبداعي والتطوير الذاتي المستمر.

التوجه السادس:

بناء تطوير قدرات البحث العلمي في الكلية بما يتواءم مع احتياجات المجتمع ومتطلبات التنمية.

التوجه السابع:

بناء شراكة حقيقية فاعلة مع المجتمع المحلي والمؤسسات المناظرة وسوق العمل الوطني والدولي.

5. Department of Oil and Gas Engineering Vision, Mission and Goals:**1. Vision**

The vision of the department is to be considered among the top departments locally and regionally and to be distinguished as a center of excellence in education and research in the area of Oil and Gas Industry.

2. Mission

The mission of the Department is to provide students with modern Oil and Gas engineering through a commitment to excellence in its graduate academic programs, advanced research capabilities, enabling graduates to compete and excel in the local and regional labor market. It prepares students to assume roles in leadership, responsibility and service to society.

3. Goals

The Department will specifically strive to:

- Provide educational program to produce quality engineers.
- Provide an environment, which will enable students and department members to contribute to the advancement of knowledge and innovative practice of Oil and Gas engineering.
- To establish and develop scientific research capabilities to create capabilities for development of knowledge, skills and competencies for continuous self-education.
- To establish real connection with Oil and Gas industry to achieve the link between the theoretical and practical knowledge gained at the department.
- To provide students with the technical experience and skills needed to design, analyze and decision making in a scientific manner.
- To contribute effectively to the development of the society and respond to the continuous development challenges.

6. Program Mission, Goals, and Outcomes:

Program Mission:

The mission of the program of oil and gas engineering is to provide undergraduate level engineers with high quality education, conduct research and serve for the Oil and Gas industry and its relevant sectors worldwide and being productive contributions for the sustainable development.

The overall aim of the program is to:

Providing future engineers with appropriate theoretical knowledge and technical skills to respond to professional market demands.

Program Educational Objectives

The objectives of Oil and Gas engineering program are to produce graduates who are able to:

1. Apply basic knowledge in engineering science, basic and applied knowledge in Oil and Gas and natural gas engineering with the emphasis on the areas of drilling, reservoir, and production.
2. Apply technology and science emphasizing on up-stream and down-stream.
3. Perform as highly skilled engineers in the local and international Oil and Gas and natural gas industry.
4. Become creative, innovative, and adaptable engineers regardless of their position as leaders or team members in their workplace and society.
5. Improve the personal skills of students in oral and written communications, multidisciplinary team-work, analytical thinking and creativity, leadership and decision making with the discernment of professional ethics,
6. Perform in global oil and gas industries and become important contributors to national development of society and environment.

7. Program Standards& Benchmarks:

Academic Standards:

1. Criteria for Accrediting Engineering Technology Programs, 2018–2019, Accreditation Bureau for Engineering and Technology (ABET).
2. National Academic Reference Standards (NARS), Engineering Program, Council for Accreditation & Quality Assurance, May 2018.

(Annex 1: Academic Standards of the Program)

Program Benchmarks:

1. King Fahd University of Petroleum and Minerals (KFUPM), College of Petroleum Engineering &

Geosciences, Petroleum Engineering Department.

2. Kuwait University, College of Engineering and petroleum, Department of petroleum engineering.
3. Sultan Qaboos University, College of Engineering, Petroleum and Natural Gas Engineering.
4. Istanbul Technical University, Faculty of Mines, Petroleum and Natural Gas Engineering.
5. United Arab Emirates University, College of Engineering, Chemical and Petroleum Engineering.
6. University Technology Malaysia (UTM), Faculty of Petroleum and Renewable Energy Engineering, Petroleum Engineering Department.

(Annex 2: Survey on Similar programs)

(Annex 3: Survey on Intended Learning Outcomes of similar programs)

(Annex 4: Survey on credit hours of similar programs)

(Annex 5: Survey on courses of similar programs)

8. Learning Outcomes:

(Knowledge and Understanding)

A1. Understand the basic principle of Oil and Gas engineering (exploration, drilling, reservoir and production).

A2. Understand impact of Oil and Gas engineering solutions in economic, environmental, and societal contexts.

A3. Understand the health and safety issues in Oil and Gas industry.

A4. Identify major contemporary issues related to Oil and Gas engineering activities.

(Intellectual skills)

B1. Analyze the results correctly to solve Oil and Gas engineering problem quickly and properly.

B2. Interpret data and simulate the technical and professional problem of Oil and Gas engineering.

B3. Identify, formulates, research relevant literature and analyze complex Oil and Gas engineering problems.

B4. Select appropriate methods for solving complex Oil and Gas engineering problems based on analytical thinking.

(Professional and Practical Skills)

C1. Design and conduct experiments, as well as analyze and interpret data to reach valid results and conclusions in the field of Oil and Gas engineering

C2. Apply knowledge of mathematics, science, engineering fundamentals, and Oil and Gas engineering principles to solve complex Oil and Gas engineering problems.

C3. Design, analyze and evaluate the Oil and Gas systems or processes within economic, environmental, social, ethical, and safety constraints

C4. Use techniques, resources and modern field engineering tools in all specialties

(General and Transferable skills)

- | |
|---|
| D1. Work effectively in teams to perform case study analyses and to present findings in written reports and verbal presentations. |
| D 2. Practice professional ethics in working Oil and Gas engineering environment. |
| D 3. Communicate effectively both orally and in writing technical reports. |
| D 4. Write reports related to Oil and Gas engineering by using modern engineering tools. |
| D 5. Learn effectively for the purpose of continuing professional development. |

9. Graduates Attributes:

Graduates Attributes

Upon successful completion of an undergraduate Oil and Gas Engineering Program, graduates should be able to:

1. Apply knowledge of mathematics, science, engineering fundamentals, and Oil and Gas engineering principles and contemporary issues to solve Oil and Gas engineering problems.
2. Design Oil and Gas systems, components or processes to meet specified needs with appropriate attention to health and safety risks, applicable standards, and economic, environmental, cultural and societal considerations.
3. Conduct Oil and Gas engineering experiments to study different Oil and Gas engineering systems as well as to use computers to analyze and interpret data.
4. Identify, formulate, and solve problems related to Oil and Gas engineering.
5. Function effectively as an individual, as a member or leader in team meetings, discussions, and responsibilities.
6. Communicate effectively on complex Oil and Gas engineering activities through written and oral modes.
7. Practice professional and ethical responsibility in Oil and Gas industry.
8. Understand the impact of Oil and Gas engineering solutions in societal, economic and environmental contexts.
9. Identify the need to engage in lifelong learning of Oil and Gas engineering.
10. Use appropriate techniques, resources, and modern engineering tools to Oil and Gas engineering activities with an understanding of the limitations.

10. Teaching and Learning Strategies:

In general, teaching and learning strategies should use a variety of teaching methods, such as:

- Active Lectures
- class discussions
- Tutorials
- Seminar/ project/presentation
- Hands-on laboratory work
- Independent learning and work

- Group learning and Problem-based learning
- Computer laboratory-based learning
- Case studies
- Design work and projects
- Field visits
- Directed self-study.

| Teaching Strategy | Description |
|------------------------------------|---|
| Active lectures | A total of fourteen 2 hr lecture in each semester. |
| Tutorials | Some courses need to have tutorial sessions to solve problems related to the subjects. The students exchange their knowledge with the teacher. |
| Seminar/ project/presentation | Assigned project is given to student and he must give a seminar to present his project. |
| Interactive class discussions | Interactive class discussions are carried out about some aspects related to the subject. |
| Laboratory based session | Laboratory based sessions are required for some courses to balance between theoretical and practical issues. |
| Computer laboratory-based sessions | The student should attend computer laboratory sessions in order to be familiar with computer programs applied in Oil and Gas engineering. |
| Directed self- study | The student should be directed to some related references to read and summarize some |
| Problem based learning | The student should be asked to solve some problems related to the subject |
| Team work (group learning) | The students are assigned to work in small groups as a team on some subjects. |
| Field visits | Some courses need to be complemented with field visits to some facilities and or companies related to Oil and Gas engineering so they will be able to able to apply the theoretical knowledge they acquired to reality. |

11. Assessment Tools:

In general, assessment in Oil and Gas Engineering education program should use a variety of methods, such as:

- Written tests (Midterm and final Exams)
- Short essays
- Written assessments such as multiple-choice questions and Quizzes
- Home works and assignments
- Oral exams
- Practical assessment
- Project reports
- Laboratory reports
- Course work Activities
- Case studies

- Presentations

| Assessment Strategy | Description |
|---|---|
| Written tests (Midterm and final Exams) | Midterm & Final exams for each course is required for all courses except Graduation Projects. These exams will evaluate the extent in which the student understanding of theoretical and applied subjects |
| Written assessments such as multiple-choice questions and Quizzes | Some points are assigned to multiple choice questions and Quizzes in order to asses' student ability to follow the lecturer during the study course. |
| Multi-competency comprehensive assessments | Some issues are assigned to students as multi-competency comprehensive assessments in order to recognize the student's ability. |
| Oral exams | Oral exams are useful to evaluate the extent of understanding the different subjects of the course. |
| Short essays | Assigning short essays measure the ability of student to write and understand the topic. |
| Report/Project/ Practical Lab Sessions | Assessing students to their ability to write theoretical and lab reports as well as the understanding of organizing the reports. The practical lab sessions are required for some courses. |
| Coursework Activities | Course work Activities is one of the assessment methods by which it can evaluate students. |
| Home works and assignments | Home works and assignments will evaluate students according to their ability to explain and illustrate the assignments they are given. |
| Case studies | Assigning case studies to students is very helpful to assess the extent of understanding the topics. |
| Presentations | Is an assessment of the ability of organizing and the way of presentation. |

12. Project Assessment:

Each project will be assessed by a committee of three members as follows

| Item | Marks Distribution |
|--|--------------------|
| Research project supervisor | 50 |
| Internal examiner: a member of the department teaching staff. | 25 |
| External examiner: a qualified external examiner (either from other departments of the faculty or from another university) | 25 |
| Total | 100 |

13. Training Course Assessment:

Each student should write and submit a report after finishing the training period and/ or field trips/training to course teacher, in the same time the assessment report from field company trainer and should be discussed in class.

14. Alignment of Program Intended Learning Outcomes (PILOs) with Teaching Strategies and Assessment Methods:

| PILOs | Teaching Strategy | Assessment Methods |
|---|---|--|
| Knowledge and Understanding A1,A2,A3,A4 | <ul style="list-style-type: none"> Lectures Group work Interactive class discussions. | <ul style="list-style-type: none"> Written exams Assignment work Quizzes Submission of reports |
| Intellectual Skills B1,B2,B3,B4 | <ul style="list-style-type: none"> Tutorial Lab and practical work Case study Group work. | <ul style="list-style-type: none"> Homework Quizzes Written exam Assignment work |
| Professional & practical skills C1,C2,C3,C4 | <ul style="list-style-type: none"> Group work Case study Laboratory experiments Project | <ul style="list-style-type: none"> Practical exam Report submission |
| General & Transferable Skills D1,D2,D3,D4,D5, | <ul style="list-style-type: none"> Self-study Group work Laboratory experiments Project | <ul style="list-style-type: none"> Project presentation Lab exam Computer based exam |

15. Intended Learning Outcomes Mapping:

See Annexes 6,7, and 8.

(Annex 6: Alignment of Program Themes with Program Intended Learning Outcomes (PILOs))

(Annex 7: Coding System and Alignment of Courses with Program Intended Learning Outcomes (PILOs))

(Annex 8: Matrix of Mapping Program PILO's With Courses)

16. Program Structure:

| Requirements | | | | | |
|---------------|--|------------|----------------|--------------|-------------------|
| No | Requirements | | No. of Courses | Credit Hours | Rational Weight % |
| 1 | University Requirements | Compulsory | 8 | 17 | 11 % |
| | | Elective | | | |
| 2 | Faculty Requirements | Compulsory | 7 | 18 | 12% |
| | | Elective | 2 | 6 | 4 % |
| 3 | Program Requirements | Compulsory | 34 | 100 | 65 % |
| | | Elective | 4 | 12 | 8 % |
| 4 | Field training, and the rate of the total hours of the program | -- | 1 | NC | 2 – 4 Weeks |
| Total: | | | 56 | 153 | 100% |

17.1. University Requirements (17 Credit hrs)

| Compulsory Courses (17 hrs) | | | | | | | | |
|-----------------------------|-------------|---------------------------|---|---|---|----------|------------------------------|-----------------|
| No | Course Code | Course Name | L | T | P | Cr. Hrs. | Prerequisites, Co-requisites | Level/ Semester |
| 1 | EIU 111 | Islamic Culture | 2 | | | 2 | | 1/1 |
| 2 | EIU 112 | Arabic Language 1 | 2 | | | 2 | | 1/1 |
| 3 | EIU 113 | English Language 1 | 2 | | | 2 | | 1/1 |
| 4 | EIU 114 | The Arab-Israeli conflict | 2 | | | 2 | | 1/1 |
| 5 | EIU 115 | Computer Fundamentals | 2 | | 2 | 3 | | 1/1 |
| 6 | EIU 121 | Arabic Language 2 | 2 | | | 2 | EIU 112 | 1/2 |
| 7 | EIU 122 | English Language 2 | 2 | | | 2 | EIU 113 | 1/2 |
| 8 | EIU 123 | National Culture | 2 | | | 2 | | 1/2 |
| 17 | | | | | | | | |

17.2.1. Faculty Requirements (18 hrs)

| Compulsory Courses 7 (18 hrs) | | | | | | | | |
|-------------------------------|-------------|--------------------------------------|---|---|---|----------|------------------------------|-----------------|
| No | Course Code | Course Name | L | T | P | Cr. Hrs. | Prerequisites, Co-requisites | Level/ Semester |
| 1 | EIT 112 | Mathematics I | 2 | 2 | | 3 | | 1/1 |
| 2 | EIT 121 | Mathematics II | 2 | 2 | | 3 | EIT 112 | 1/2 |
| 3 | EIT 221 | Engineering Probability & Statistics | 2 | | 2 | 3 | EIT 112 | 2/2 |
| 4 | EIT 211 | Technical English | 2 | | | 2 | EIU 122 | 2/1 |
| 5 | EIT 311 | Scientific Research Method | 2 | | | 2 | NA | 3/1 |
| 6 | EIT 312 | Communication Skills | 2 | | | 2 | | 3/1 |
| 7 | EIT 321 | Project Management | 2 | | 2 | 3 | | 3/2 |
| 18 | | | | | | | | |

17.2.2. Faculty Elective Courses: 2 courses (6 hrs)

| Elective Course 2 (6 hrs) | | | | | | | | |
|---------------------------|-------------|---------------------|---|---|---|----------|------------------------------|-----------------|
| No | Course Code | Course Name | L | T | P | Cr. Hrs. | Prerequisites, Co-requisites | Level/ Semester |
| 1 | EIT 111 | Engineering Physics | 2 | 2 | | 3 | | 1/1 |
| 2 | EIT 113 | Engineering Drawing | 1 | | 4 | 3 | | 1/1 |
| 3 | EIT 113 | | | | | | | |
| 4 | EIT 113 | | | | | | | |

17.3.1. Program Major (100 hrs)

| Compulsory Courses 34 (100 hrs) | | | | | | | | |
|---------------------------------|-------------|---------------------------------------|---|---|---|----------|------------------------------|-----------------|
| No | Course Code | Course Name | L | T | P | Cr. Hrs. | Prerequisites, Co-requisites | Level/ Semester |
| 1 | OGE 121 | Fundamentals of Petroleum Engineering | 3 | 0 | | 3 | | 1/2 |
| 2 | OGE 122 | Engineering Chemistry | 2 | | 2 | 3 | | 1/2 |
| 3 | OGE 123 | Statics & Dynamics | 2 | 2 | | 3 | | 1/2 |
| 4 | OGE 124 | General Geology | 3 | | 2 | 4 | | 1/2 |
| 5 | OGE 211 | Strength of Materials | 2 | 2 | | 3 | OGE 123 | 2/1 |
| 6 | OGE 212 | Vectors and Matrices | 2 | 2 | | 3 | EIT 121 | 2/1 |
| 7 | OGE 213 | Petroleum Geology | 2 | 2 | | 3 | OGE 124 | 2/1 |
| 8 | OGE 214 | Drilling Engineering 1 | 2 | 2 | 2 | 4 | OGE 121 | 2/1 |

| | | | | | | | | |
|--------------|---------|------------------------------------|------------|---|---|---|------------------|-----|
| 9 | OGE 215 | Reservoir Rock Properties | 2 | 1 | 1 | 3 | OGE 121 | 2/1 |
| 10 | OGE 216 | Engineering Thermodynamics | 2 | 2 | | 3 | EIT 112, EIT 111 | 2/1 |
| 11 | OGE 221 | Drilling Engineering 2 | 2 | 2 | | 3 | OGE 214 | 2/2 |
| 12 | OGE 222 | Reservoir Fluid Properties | 2 | 1 | 1 | 3 | OGE 121, OGE 216 | 2/2 |
| 13 | OGE 223 | Differential Equations | 2 | 2 | | 3 | EIT 112 | 2/2 |
| 14 | OGE 224 | Petroleum Geophysics | 2 | 2 | | 3 | OGE 124, OGE 213 | 2/2 |
| 15 | OGE 225 | Well Logging | 2 | | | 2 | EIT 111, OGE 215 | 2/2 |
| 16 | OGE 226 | Fluid Mechanics | 2 | | 2 | 3 | EIT 121 | 2/2 |
| 17 | OGE 311 | Reservoir Engineering 1 | 2 | 2 | | 3 | OGE 215, OGE 222 | 3/1 |
| 18 | OGE 312 | Formation Evaluation | 2 | 2 | | 3 | OGE 225 | 3/1 |
| 19 | OGE 313 | Well Completion | 2 | 2 | | 3 | OGE 121, OGE 221 | 3/1 |
| 20 | OGE 314 | Computer Programming | 1 | | 4 | 3 | EIU 115, OGE 211 | 3/1 |
| 21 | OGE 315 | Technical Report Writing | 2 | | | 2 | EIT 222 | 3/1 |
| 22 | OGE 321 | Production Engineering 1 | 2 | 2 | | 3 | OGE 313 | 3/2 |
| 23 | OGE 322 | Reservoir Engineering 2 | 2 | 2 | | 3 | OGE 311 | 3/2 |
| 24 | OGE 323 | Natural gas Engineering | 2 | 2 | | 3 | OGE 313 | 3/2 |
| 25 | OGE 324 | Health Safety & Environment | 2 | | | 2 | N/A | 3/2 |
| 26 | OGE 326 | Numerical Methods | 2 | | 2 | 3 | | 3/2 |
| 27 | OGE 411 | Graduation Project 1 | 0 | | 4 | 2 | | 4/1 |
| 28 | OGE 412 | Petroleum Production Engineering 2 | 2 | 2 | | 3 | OGE 321 | 4/1 |
| 29 | OGE 413 | Well Testing | 2 | 2 | | 3 | OGE 311, OGE 312 | 4/1 |
| 30 | OGE 414 | Reservoir Simulation | 2 | | 2 | 3 | OGE 311, OGE 314 | 4/1 |
| 31 | OGE 421 | Graduation Project 2 | 0 | 0 | 8 | 4 | OGE 411 | 4/2 |
| 32 | OGE 422 | Surface Production Facilities | 2 | 2 | | 3 | OG 412 | 4/2 |
| 33 | OGE 423 | Enhanced Oil Recovery | 2 | 2 | | 3 | OGE 322 | 4/2 |
| 34 | OGE 424 | Petroleum Economics | 2 | | | 2 | | 4/2 |
| Total | | | 100 | | | | | |

17. 3.2. Elective Courses: 4 courses (12 hrs)

| Elective Course 1 (3 hrs) | | | | | | | | |
|---------------------------|-------------|---|---|---|---|----------|------------------------------|-----------------|
| No | Course Code | Course Name | L | T | P | Cr. Hrs. | Prerequisites, Co-requisites | Level/ Semester |
| 1 | OGE 325 | Directional Drilling | 2 | 2 | | 3 | Dept. approval | 3/2 |
| 2 | OGE 325 | Advanced Well Control | 2 | 2 | | 3 | Dept. approval | 3/2 |
| 3 | OGE 325 | Petroleum System in Yemen | 2 | 2 | | 3 | Dept. approval | 3/2 |
| Elective Course 2 (3 hrs) | | | | | | | | |
| No | Course Code | Course Name | L | T | P | Cr. Hrs. | Prerequisites, Co-requisites | Level/ Semester |
| 1 | OGE 415 | Storage and Transportation of Crude Oil and Gas | 2 | 2 | | 3 | Dept. approval | 4/1 |
| 2 | OGE 415 | Petroleum Refinery Engineering | 2 | | 2 | 3 | Dept. approval | 4/1 |
| 3 | OGE 415 | Horizontal Well Technology | 2 | 2 | | 3 | Dept. approval | 4/1 |
| 4 | OGE 415 | Offshore Operations Technology | 2 | 2 | | 3 | Dept. approval | 4/1 |
| Elective Course 3 (3 hrs) | | | | | | | | |

| No | Course Code | Course Name | L | T | P | Cr. Hrs. | Prerequisites, Co-requisites | Level/ Semester |
|---------------------------|-------------|--|---|---|---|----------|------------------------------|-----------------|
| 1 | OGE 416 | Computer Applications in petroleum Engineering | 2 | | 2 | 3 | Dept. approval | 4/1 |
| 2 | OGE 416 | Field Processing of Natural Gas | 2 | | 2 | 3 | Dept. approval | 4/1 |
| 3 | OGE 416 | Naturally Fractured Reservoirs | 2 | | 2 | 3 | Dept. approval | 4/1 |
| | | | | | | | | |
| | | | | | | | | |
| Elective Course 4 (3 hrs) | | | | | | | | |
| No | Course Code | Course Name | L | T | P | Cr. Hrs. | Prerequisites, Co-requisites | Level/ Semester |
| 1 | OGE 425 | Production Logging | 2 | 2 | | 3 | Dept. approval | 4/2 |
| 2 | OGE 425 | Stimulation and Sand Production Management | 2 | 2 | | 3 | Dept. approval | 4/2 |
| 3 | OGE 425 | Production systems design and analysis | 2 | 2 | | 3 | Dept. approval | 4/2 |

17. 3.3. Field Training (None Credit hrs)

| Elective Course 1 (3 hrs) | | | | | | | | |
|---------------------------|-------------|----------------|---|---|---|----------|------------------------------|-----------------|
| No | Course Code | Course Name | L | T | P | Cr. Hrs. | Prerequisites, Co-requisites | Level/ Semester |
| 1 | OGE 327 | Field Training | | | | NC | | 3/2 |

Field training for 4 weeks in industry, 100 working hours of field training. Student presents a comprehensive report of training activities and assignments upon completion of the training period. The students are required to perform a field training under supervision of signed faculty member and field supervisor.

18. Study Plan:

18.1. Level 1

| Term 1 | | | | | | | |
|--------|-------------|---------------------------------------|---|---|---|----------|------------------------------|
| No. | Course Code | Course Name | L | T | P | Cr. Hrs. | Prerequisites, Co-requisites |
| 1 | EIU 111 | Islamic Culture | 2 | | | 2 | |
| 2 | EIU 112 | Arabic Language 1 | 2 | | | 2 | |
| 3 | EIU 113 | English Language 1 | 2 | | | 2 | |
| 4 | EIU 114 | The Arab-Israeli conflict | 2 | | | 2 | |
| 5 | EIT 111 | Engineering Physics | 2 | 3 | | 3 | |
| 6 | EIT 112 | Mathematics 1 | 2 | 2 | | 3 | |
| 7 | EIT 113 | Engineering Drawing | 1 | | 4 | 3 | |
| 8 | EIU 115 | Computer Fundamentals | 2 | | 2 | 3 | |
| 18 | | | | | | | |
| Term 2 | | | | | | | |
| No. | Course Code | Course Name | L | T | P | Cr. Hrs. | Prerequisites, Co-requisites |
| 1 | EIU 121 | Arabic Language 2 | 2 | | | 2 | EIU 112 |
| 2 | EIU 122 | English Language 2 | 2 | | | 2 | EIU113 |
| 3 | OGE 121 | Fundamentals of Petroleum Engineering | 3 | | | 3 | |
| 4 | EIT 121 | Mathematics II | 2 | 2 | | 3 | EIT 112 |
| 5 | OGE 122 | Engineering Chemistry | 2 | | 2 | 3 | |
| 6 | OGE 123 | Statics & Dynamics | 2 | 2 | | 3 | |
| 7 | OGE 124 | General Geology | 3 | | 2 | 4 | |
| 8 | EIU 123 | National Culture | 2 | | | 2 | |
| 22 | | | | | | | |

18.2. Level 2

| Term 1 | | | | | | | |
|--------|-------------|--------------------------------------|---|---|---|----------|------------------------------|
| No. | Course Code | Course Name | L | T | P | Cr. Hrs. | Prerequisites, Co-requisites |
| 1 | OGE 211 | Vectors and Matrices | 2 | 2 | | 3 | EIT121 |
| 2 | OGE 212 | Strength of Materials | 2 | 2 | | 3 | OGE 123 |
| 3 | EIT 211 | Technical English | 2 | | | 2 | EIU122 |
| 4 | OGE 213 | Petroleum Geology | 2 | 2 | | 3 | OGE 124 |
| 5 | OGE 214 | Drilling Engineering 1 | 2 | 2 | 2 | 4 | OGE 121 |
| 6 | OGE 215 | Reservoir Rock Properties | 2 | | 2 | 3 | OGE 121 |
| 7 | OGE 216 | Engineering Thermodynamics | 2 | 2 | | 3 | EIT 112, EIT 111 |
| 21 | | | | | | | |
| Term 2 | | | | | | | |
| No. | Course Code | Course Name | L | T | P | Cr. Hrs. | Prerequisites, Co-requisites |
| 1 | OGE 221 | Drilling Engineering 2 | 2 | 2 | | 3 | OGE 214 |
| 2 | OGE 222 | Reservoir Fluid Properties | 2 | 1 | 1 | 3 | OGE 121, OGE 216 |
| 3 | OGE 223 | Differential Equations | 2 | 2 | | 3 | EIT112 |
| 4 | OGE 224 | Petroleum Geophysics | 2 | 2 | | 3 | OGE 124, OGE 213 |
| 5 | OGE 225 | Well Logging | 2 | | | 2 | EIU 111, OGE 215 |
| 6 | EIT 221 | Engineering Probability & Statistics | 2 | | 2 | 3 | EIT112 |
| 7 | OGE 226 | Fluid Mechanics | 2 | 2 | | 3 | EIT121 |
| 20 | | | | | | | |

18.3. Level 3

| Term 1 | | | | | | | |
|--------|-------------|-----------------------------|---|---|---|----------|------------------------------|
| No. | Course Code | Course Name | L | T | P | Cr. Hrs. | Prerequisites, Co-requisites |
| 1 | OGE 311 | Reservoir Engineering 1 | 2 | 2 | | 3 | OGE 215, OGE 222 |
| 2 | OGE 312 | Formation Evaluation | 2 | 2 | | 3 | OGE 225 |
| 3 | OGE 313 | Well Completion | 2 | 2 | | 3 | OGE 121, OGE 221 |
| 4 | OGE 314 | Computer Programming | 1 | | 4 | 3 | EIU 115, OGE 211 |
| 5 | OGE 315 | Technical Report Writing | 2 | | | 2 | EIT 211 |
| 6 | EIT 311 | Scientific Research Method | 2 | | | 2 | NA |
| 7 | EIT 312 | Communication Skills | 2 | | | 2 | NA |
| | | | | | | | 18 |
| Term 2 | | | | | | | |
| No | Course Code | Course Name | L | T | P | Cr. Hrs. | Prerequisites, Co-requisites |
| 1 | OGE 321 | Production Engineering 1 | 2 | 2 | | 3 | OGE 313 |
| 2 | OGE 322 | Reservoir Engineering 2 | 2 | 2 | | 3 | OGE 311 |
| 3 | EIT 321 | Project Management | 2 | 2 | | 3 | NA |
| 4 | OGE 323 | Natural gas Engineering | 2 | 2 | | 3 | OGE 313 |
| 5 | OGE 324 | Health Safety & Environment | 2 | | | 2 | NA |
| 6 | OGE 325 | Elective Course 1 | 2 | 2 | | 3 | Dept. approval |
| 7 | OGE326 | Numerical Methods | 2 | | 2 | 3 | |
| 8 | OGE 327 | Field Training | | | | NC | |
| | | | | | | | 20 |

Field training for 4 weeks in industry (0 credits)

18.4. Level 4

| Term 1 | | | | | | | |
|--------|-------------|-------------------------------|---|---|---|----------|------------------------------|
| No. | Course Code | Course Name | L | T | P | Cr. Hrs. | Prerequisites, Co-requisites |
| 1 | OGE 411 | Graduation Project 1 | 0 | 4 | 0 | 2 | |
| 2 | OGE 412 | Production Engineering 2 | 2 | 2 | | 3 | OGE 321 |
| 3 | OGE 413 | Well Testing | 2 | 2 | | 3 | OGE 311, OGE 312 |
| 4 | OGE 414 | Reservoir Simulation | 2 | | 2 | 3 | OGE 311, OGE 314 |
| 5 | OGE 415 | Elective Course 2 | 2 | | 2 | 3 | Dept. approval |
| 6 | OGE 416 | Elective Course 3 | 2 | | 2 | 3 | Dept. approval |
| 17 | | | | | | | |
| Term 2 | | | | | | | |
| No. | Course Code | Course Name | L | T | P | Cr. Hrs. | Prerequisites, Co-requisites |
| 1 | OGE 421 | Graduation Project 2 | 0 | 8 | 0 | 4 | OGE 411 |
| 2 | OGE 422 | Surface Production facilities | 2 | 2 | | 3 | OGE 412 |
| 3 | OGE 423 | Enhanced Oil Recovery | 2 | 2 | | 3 | OGE 322 |
| 4 | OGE 424 | Petroleum Economics | 2 | | | 2 | |
| 5 | OGE 425 | Elective Course 4 | 2 | | 2 | 3 | Dept. approval |
| 15 | | | | | | | |

19. Distribution of Total Credit Hours:

| Level | Term | University Requirements | | Faculty Requirements | | Program Requirements | | Program Electives | | Training | | Total Cr. Hrs | | Total Cr. Hrs./ Level |
|-------------|--------|-------------------------|--------------|----------------------|--------------|----------------------|--------------|-------------------|--------------|----------------|--------------|----------------|--------------|-----------------------|
| | | No. of Courses | Credit Hours | No. of Courses | Credit Hours | No. of Courses | Credit Hours | No. of Courses | Credit Hours | No. of Courses | Credit Hours | No. of Courses | Credit Hours | |
| First | First | 5 | 11 | 3 | 9 | | | | | | | 8 | 20 | 42 |
| | Second | 3 | 6 | 1 | 3 | 4 | 13 | | | | | 8 | 22 | |
| Second | First | | | 1 | 2 | 6 | 19 | | | | | 7 | 21 | 41 |
| | Second | | | 1 | 3 | 6 | 17 | | | | | 7 | 20 | |
| Third | First | | | 2 | 4 | 5 | 14 | | | | | 7 | 18 | 38 |
| | Second | | | 1 | 3 | 5 | 14 | 1 | 3 | 1 | - | 8 | 20 | |
| Fourth | First | | | | | 4 | 12 | 2 | 6 | | | 7 | 18 | 32 |
| | Second | | | | | 4 | 11 | 1 | 3 | | | 4 | 14 | |
| Total: | | 8 | 17 | 9 | 24 | 34 | 100 | 4 | 12 | | | 56 | 153 | 153 |
| Percentage: | | 11 % | | 16 % | | 65% | | 8 % | | - | | 100 % | | 100 % |

20. Admission Requirements:

- Admissions to the program shall be made as per the admission rules set by the Ministry of Higher Education and Scientific Research as well as university admission guidelines.
- General Secondary school certificate (Science Section) or any equivalent certificate with grade as specified in the admission rules made by Ministry of Higher Education and Scientific Research.
- Pass the aptitude test and personal interview.
- Any necessary requirement for specialization, decided by the Scientific Section.

21. Attendance and Graduation Requirements:

1. Student attendance should not be less than 75%.
2. Student will graduate after successfully passing all program requirements.
3. Total credit hours for the program are 153 credit hours.
4. Minimum score for any student to pass any credit hours course is 50% degree.

22. Grading System:

| | |
|---------------------------------|-----------|
| From 90% to 100% of total marks | Excellent |
| From 80% to less than 90% | Very Good |
| From 65% to less than 80% | Good |
| From 50% to less than 65% | Pass |
| Less than 50% | Poor/Fail |

23. Facilities Required for Running the Program:

| | | |
|---|---|---|
| 1 | Accommodation | <ul style="list-style-type: none">• Lecture room for 51 students provided with whiteboard and relaxed seats• laboratory for all related courses• Computer laboratory equipped with required up-to-date software packages. |
| 2 | Computers and Electronic Devices | <ul style="list-style-type: none">• Computers• Data show• Internet network• Original software packages |
| 3 | Library needs | <ul style="list-style-type: none">• Computers, Internet connections |

24. Program Policies:**Based on University Regulations**

| | |
|----|---|
| 1. | (Class Attendance): 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. If the student is absent due to illness, he/she should bring a proof statement from university Clinic. If the absent is more than 25% of a course total contact hour, student will be required to retake the entire course again. |
| 2. | (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. |
| 3. | (Exam Attendance/Punctuality) : 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 he/she will be considered as absent in exam. |

| | |
|----|--|
| 4. | (Assignments & Projects) : In general, one assignment is given to the students after each chapter; the student has to submit all the assignments for checking on time, mostly one week after given the assignment. |
| 5. | (Cheating) : For cheating in exam, a student will be considered as fail. In case the cheating is repeated three times during his/her study the student will be disengaged from the faculty. |
| 6. | (Plagiarism) : Plagiarism is the attending of a student the exam of a course instead of another student. If the examination committee proofed a plagiarism of a student, he/she will be disengaged from the faculty. The final disengagement of the student from the faculty should be confirmed from the Student Council Affair of the university or according to the university roles. |
| 7. | (Other policies) : <ul style="list-style-type: none"> - 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 class during the examination. - Lecture notes and assignments might be given directly to students using soft or hard copy. |

To be filled by the university

25. Faculty to Conduct the Program:

| Rank or Administrative position | General Specialization | Specialization | Required Number | Full-time | Part-time | Student/Lecturer ratio | Total |
|---------------------------------|------------------------|----------------|-----------------|-----------|-----------|------------------------|-------|
| Professor | | | | | | | |
| Associate Professor | | | | | | | |
| Assistant Professor | | | | | | | |
| Lecturer | | | | | | | |
| Demonstrator | | | | | | | |
| Technician | | | | | | | |
| Lecturer | | | | | | | |
| Administrator | | | | | | | |
| Others | | | | | | | |

26. Learning Resources:

| Learning Resources | Required Material |
|--------------------------|--|
| References and Textbooks | 5 References and 2 Textbooks for each course |
| Scientific Journals | Oil & Gas Journal, SPE, One Petro |
| Computer software | Oil and Gas Related software packages |
| Other Resources | Web Site References |

27. Lecture Rooms:

| # | Lecture Rooms | Qty. | Capacity |
|---|---------------|------|----------|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |

28. Program Evaluation and improvement:

| # | Evaluation Targeted | Assessment method | Result |
|---|-------------------------------|------------------------------|--------|
| 1 | Faculty Members | Evaluation sheet | |
| 2 | Senior students | Evaluation sheet | |
| 3 | Alumni | Evaluation sheet & interview | |
| 4 | Stakeholders | Evaluation sheet & interview | |
| 5 | External & Internal Reviewers | Evaluation report | |

29. Consultancy Committee:

| # | Consultant Name | Specialization | Working at | Comments |
|---|------------------------------|--------------------------------|---|------------------|
| 1 | Mahyoub A. Saeed | Petroleum Geology | Sana'a Un. | Assoc. Professor |
| 2 | Abbas M. A. Alkhudafi | Reservoir/Production | Hadhramout Un. | Professor |
| 3 | Dr. Nasser A. A. H. Al-Muafa | Geophysical Petroleum Engineer | International University of Technology Twintech | Assoc. Professor |

30. Evaluation Committee:

| # | Evaluator Name | Specialization | Working at | Comments |
|---|----------------|----------------|------------|----------|
| 1 | | | | |
| 2 | | | | |
| 3 | | | | |
| 4 | | | | |