



University of Technology
الجامعة التكنولوجية
Oil and Gas Engineering Department



قسم هندسة النفط والغاز

First Cycle – Bachelor's Degree
(B.Sc.) – Petroleum Engineering

بكالوريوس – هندسة النفط



Table of Contents

1. Overview
2. Undergraduate Modules 2023-2024
3. Contact

1. Overview

This catalogue is about the courses (modules) given by the program of Petroleum Engineering to gain the Bachelor of Science degree. The program delivers (48) Modules with (6000) total student workload hours and 240 total ECTS. The module delivery is based on the Bologna Process.

نظرة عامه

يتناول هذا الدليل المواد الدراسية التي يقدمها برنامج هندسة النفط للحصول على درجة بكالوريوس العلوم. يقدم البرنامج (48) مادة دراسية، على سبيل المثال، مع (٦٠٠٠) إجمالي ساعات حمل الطالب و ٢٤٠ إجمالي وحدات أوروبية. يعتمد تقديم المواد الدراسية على عملية بولونيا.

2. Undergraduate Courses 2023-2024

Module 1

Code	Course/Module Title	ECTS	Semester
ENLA111	English Language I	4	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	63	37
Description			
<p>In view of the growing importance of English as a tool for global communication and the consequent emphasis on training students to acquire language skills, this syllabus of English has been designed to develop linguistic, communicative and critical thinking competencies of Engineering students. In English classes, the focus is going to be on the skills development in the areas of vocabulary, grammar, reading and writing. For this, we are going to use the prescribed text for detailed study. The students are encouraged to read the texts leading to reading comprehension and different passages may be given for practice in the class. The time should be utilized for working out the exercises given after each excerpt, and also for supplementing the exercises with authentic materials of a similar kind, for example, newspaper articles, advertisements, promotional material etc. The focus in this syllabus is on skill development, fostering ideas and practice of language skills in various contexts and cultures.</p> <p>The module will help to:</p> <ul style="list-style-type: none">• Improve the language proficiency of students in English with an emphasis on Vocabulary, Grammar, Reading and Writing skills.• Equip students to study academic subjects more effectively and critically using the theoretical and practical components of English syllabus.• Develop study skills and communication skills in formal and informal situations.			

Module 2

Code	Course/Module Title	ECTS	Semester
PRPE112	Principle to Petroleum Engineering	5	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
4		63	62
Description			
<p>The object of this module is to familiarize students with all aspects of the oil and gas industry, from its discovery and early history to its current state. This includes operations required to explore, drill, and produce oil wells as well as post-production procedures like well stimulation and production enhancement.</p>			

Module 3

Code	Course/Module Title	ECTS	Semester
CALC113	Calculus I	6	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	2	78	72
Description			
<p>The topics of this module include techniques of limits, continuity, and computations of derivatives—sum, product, exponential and logarithm functions, trigonometric functions, implicit differentiation, applications of derivatives to optimization problems, and related rate problems.</p>			

Module 4

Code	Course/Module Title	ECTS	Semester
EMSM114	Engineering Mechanics and Strength of Material	6	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
4	2	93	57
Description			
<p>This module covers two main parts:</p> <ul style="list-style-type: none"> • Fundamental principles, about the motion, velocity, newton's laws, static inertia, fluid inertia, sliding friction, rolling friction and help the student to solve and understand the problems. • Strength of material is the discipline of investigating the relationships that exist between the structures and properties of materials. Engineering material is designing or engineering the structure of a material to produce a predetermined set of properties. This part covers principles of stress and strain. Develops understanding of force, heat deformation, material properties, allowable strength, young modulus Poisson ratio. It also covers hook laws, shear stress, Mohr circles, and the general strain energy equation. 			

Module 5

Code	Course/Module Title	ECTS	Semester
COPR115	Computer Programming I	5	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	3	78	47
Description			
<p>Computer Proficiency is an inevitable part of commerce education. The module is aiming to equip all the commerce aspirants to have basic skills as well as hands on experience on word processing, for creating excel spreadsheets, for building databases through the use of Microsoft Office Word, Excel, and VBA .</p>			

Module 6

Code	Course/Module Title	ECTS	Semester
WORK116	Workshop I	4	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
0	6	90	10
Description			
<p>This module designed to provide the students with practical experience in different general aspects, the students in this module will work in different workshops such as electric workshop, carpentry workshop, turning workshop, blacksmith workshop, welding workshop, car workshop and rasp workshop. At the ends of this module the student will able to deal with most engineering practical practice.</p>			

Module 7

Code	Course/Module Title	ECTS	Semester
CHEM121	Chemistry	6	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
4	2	93	57
Description			
<p>This module is designed to provide two main parts:</p> <ul style="list-style-type: none">• Fundamental overview of chemistry to students, chemistry is the study of matter, including its composition, structure, physical properties, and reactivity. There are many approaches to study chemistry, but, for convenience, we traditionally divide it into five fields: organic, inorganic, physical, biochemical, and analytical. Analytical chemistry is often described as the area of chemistry responsible for characterizing the composition of matter, both qualitatively (what is present) and quantitatively (how much is present). This description is misleading. After all, almost all chemists routinely make qualitative or quantitative measurements.• Fundamental overview of organic chemistry to students interested in pursuing a career in the sciences. It is focusing primarily on the basic principles to understand the structure, properties, composition, and preparation (by Synthesis or by other means) of Carbon-based compounds, Hydrocarbons, and their derivatives. These compounds may contain any number of other elements, including Hydrogen, Nitrogen, Oxygen, the Halogens as well as Phosphorus, Silicon, and Sulfur, and reactivity of organic molecules. Emphasis is on substitution and elimination reactions and chemistry of the alkyl group.			

Module 8

Code	Course/Module Title	ECTS	Semester
GEGE122	General Geology	6	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
4	2	93	57
Description			
<p>This module contains two main parts:</p> <ul style="list-style-type: none">• Facilitate a better understanding of Earth rock formation, rocks types, process and factors effect on Earth crust which will guide the student to appreciate Geology and geologic processes, and to provide students with the tools to interpret the minerals and rock types and fossil record. Laboratory exercises and field trips will highlight and enhance the concepts learned in the classroom.• Sedimentary rock is the branch of geology that deals with sediments and sedimentary rocks. The principles of sedimentary rocks and their relationship to petroleum engineering are covers here. Develops an understanding of the type, characterization, formation, and Petrophysics characterization of sedimentary rocks It also covers Reservoirs rocks and prediction of Reservoir quality.			

Module 9

Code	Course/Module Title	ECTS	Semester
CALC123	Calculus II	6	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	2	78	72
Description			
<p>This module comprises Gilbert Strang's clear direct style and detailed, intensive explanations make calculus ideal as both a course companion and for self-study. Single variable and multivariable calculus are covered in depth. Key examples of the application of calculus to areas such as physics, engineering and economics are included in order to enhance students', understanding.</p>			

Module 10

Code	Course/Module Title	ECTS	Semester
ENPR124	Engineering Practices	4	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	63	37
Description			
<p>This module includes a display problem of representing the needs of the community using the learning method is based on the problem.</p> <p>The problem, which represents the needs of the community scenario includes a description of the problem is similar to the practical realities and limitations of the data that can be obtained by the engineer to reach a solution based on the research and information collection Presented.</p> <p>The other side includes the use of the computer program (AutoCAD soft.) to draw using the computer to build his skills in the field of engineering drawing and design</p>			

Module 11

Code	Course/Module Title	ECTS	Semester
ENET125	Engineering Ethics	4	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	1	48	52
Description			
<p>This module deals with the understanding and importance of integrity and responsible, ethical and scientific behavior towards engineering work and the most important associations concerned with these</p>			

important topics and their impact on the future of engineering work

Module 12

Code	Course/Module Title	ECTS	Semester
WORK126	Workshop II	4	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
0	6	90	10
Description			
<p>This module designed to provide the students with practical experience in different general aspects, the students in this module will work in different workshops such as electric workshop, carpentry workshop, turning workshop, blacksmith workshop, welding workshop, car workshop and rasp workshop. At the ends of this module the student will able to deal with most engineering practical practice.</p>			

Module 13

Code	Course/Module Title	ECTS	Semester
ACEW211	Academic English writing	4	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	63	37
Description			
<p>In view of the growing importance of English as a tool for global communication and the consequent emphasis on training students to acquire language skills, this syllabus of English has been designed to develop linguistic, communicative and critical thinking competencies of Engineering students. In English classes, the focus is going to be on the skills development in the areas of vocabulary, grammar, reading and writing. For this, we are going to use the prescribed text for detailed study. The students are encouraged to read the texts leading to reading comprehension and different passages may be given for practice in the class. The time should be utilized for working out the exercises given after each excerpt, and also for supplementing the exercises with authentic materials of a similar kind, for example, newspaper articles, advertisements, promotional material etc. The focus in this syllabus is on skill development, fostering ideas and practice of language skills in various contexts and cultures. This 2nd part of the course will help to:</p> <ul style="list-style-type: none"> ➤ Improve the language proficiency of students in English with an emphasis on Vocabulary, Grammar, Reading and Writing skills. ➤ Equip students to study academic subjects more effectively and critically using the theoretical and practical components of English syllabus. 			

Module 14

Code	Course/Module Title	ECTS	Semester
------	---------------------	------	----------

OPDE212	Ordinary and Partial differential equations	6	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	2	78	72
Description			
<p>Differential equations are of basic importance in engineering mathematics because many physical laws and relations appear mathematically in the form of a differential equation. Ordinary differential equations (ODE) that will cover here with different orders have many applications in physical problem solution such as heating and cooling, growth and decay, falling body's, spring vibration, electrical circuits and so forth. PDEs are models of various physical and geometrical problems, arising when the unknown functions (the solutions) depend on two or more variables. It is fair to say that only the simplest physical systems can be modeled by ODEs, whereas most problems in dynamics, elasticity, heat transfer, electromagnetic theory, and quantum mechanics require PDEs. Indeed, the range of applications of PDEs is enormous, compared to that of ODEs. Here we concentrate on the most important PDEs of applied mathematics, the wave equations governing the vibrating string and the vibrating membrane, the heat equation, the Laplace equation and the fluid flow equation. Special functions are short ways to solve differential equations, Gamma function is easy way to find numbers of integrations, Bessel function is very important to solve some of differential equation without needing to solve by common methods, error function is important in hydraulic fracturing, and exponential integral function is important in solution of diffusivity equation. Tayler and Fourier series and Fourier and Laplace transforms with them inverses are constitute a very important tool, in particular in solving problems that involve ODEs and PDEs.</p>			

Module 15

Code	Course/Module Title	ECTS	Semester
FLME213	Fluid Mechanic I	5	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	1	63	62
Description			
<p>This course provides students an information on the principal concepts and methods of fluid mechanics. Topics covered in the course include pressure, hydrostatics, control volume analysis; mass conservation, momentum conservation and energy conservation for moving fluids; viscous fluid flows, flow through pipes; dimensional analysis; boundary layers. Students will work to formulate the models necessary to study, analyze, and design fluid systems through the application of these concepts, and to develop the problem-solving skills essential to good engineering practice of fluid mechanics in practical applications.</p>			

Module 16

Code	Course/Module Title	ECTS	Semester
COPR214	Computer Programming II	5	1

Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	2	78	47
Description			
<ul style="list-style-type: none"> - This courseware is designed for the new AutoCAD® user who requires comprehensive training in AutoCAD. It incorporates the features, commands, and techniques for creating, editing, and printing drawings with AutoCAD LT. Hands-on exercises throughout the courseware explore how to create 2D production drawings - This courseware is designed for the new AutoCAD® user who requires comprehensive training in AutoCAD. It incorporates the features, commands, and techniques for creating, editing, and printing drawings with AutoCAD LT. Hands-on exercises throughout the courseware explore how to create 2D production drawings. 			

Module 17

Code	Course/Module Title	ECTS	Semester
STGE215	Structural geology	5	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	2	78	47
Description			
<p>structure geology is the branch of geology that deals with stress and deformation of rocks. This course covers the principles of structure geology and their relationship to petroleum engineering. Develops an understanding of the Stress and deformation in rocks. brittle deformation and the nature of naturally fractured reservoirs. It also covers ductile deformation and traps</p>			

Module 18

Code	Course/Module Title	ECTS	Semester
STOP216	Statistical and Optimization	5	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
4	1	78	47
Description			
<p>Foundation material in probability and statistical inference. Topics include sample spaces, conditional probability, random variables, discrete and continuous probability distributions, expectation, estimation, and hypothesis testing as well as Simple linear regression.</p>			

Module 19

Code	Course/Module Title	ECTS	Semester
------	---------------------	------	----------

PEGE221	Petroleum Geology	4	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	1	63	37
Description			
<p>Petroleum is a diagenetic fluid produced by the thermally-driven alteration of marine organic matter in sedimentary rocks. Understanding the nature of the organic-rich source rock, the paleo-aquifers in which the petroleum flowed, and the trapping mechanism are important parts of Petroleum Geology. A petroleum engineer needs to have a broad knowledge of sedimentary geology (sedimentology and petrography), stratigraphy, structural geology, and hydrogeology. All of these are components that are used to construct the evolutionary histories of sedimentary basins. Thus, a successful petroleum engineer needs a broad background, and a willingness to learn and apply a wide range of information and techniques to the problems of finding, developing, and exploiting a petroleum reservoir.</p>			

Module 20

Code	Course/Module Title	ECTS	Semester
PTCO222	Properties and transportation of crude oil and gas	5	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	2	78	47
Description			
<ul style="list-style-type: none"> - Provide students with knowledge and science about the characteristics of crude oil and its products in terms of classification and use. Products and methods of obtaining them as well as disposal methods of unwanted compounds in crude oil or its various products (light, medium and heavy). - Providing students with science and knowledge in oil and gas different types of transportation as single-phase flow and two-phase flow, stresses types, study the types of pumps, compressors, legislation and laws relating to the transfer and storage of oil and gas, methods of storage and calculations of economic diameter. 			

Module 21

Code	Course/Module Title	ECTS	Semester
FLME223	Fluid Mechanics II	6	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	3	93	57
Description			
<p>This course provides students an information on the principal concepts and methods of fluid mechanics. Topics covered in the course include pipe systems and pipes network, fluid measurements (types and their importance), Non Newtonian liquids, dimensional analysis, pumps, flow of compressible fluid,</p>			

and flow in porous media. Students will work to formulate the models necessary to study, analyze, and design fluid systems through the application of these concepts, and to develop the problem-solving skills essential to good engineering practice of fluid mechanics in practical applications.

Module 22

Code	Course/Module Title	ECTS	Semester
PERE224	Petrophysics of Reservoir Engineering	6	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	2	78	72
Description			
<p>Petrophysical properties required for typical reservoir engineering purposes include porosity, pore volume compressibility, permeability, relative-permeability-vs. -saturation curves, capillary-pressure-vs. -saturation curves, wettability, net pay thickness and liquid saturations.</p> <p>These properties affect fluid flow within the reservoir and thus well productivity.</p> <p>Porosity is the rock ability to save fluid in it, net pay thickness is a hydrocarbon thickness zone, and fluid saturation is the ratio of fluid contained in pore volume. they are important in initial hydrocarbon in place calculation. permeability is the rock ability to transmit fluid through it and it is very important in calculation of fluid flow rate by using Darcy law.</p> <p>Other properties such as fluid compressibility and capillary pressure are important in oil reserves values and fluid flow through porous media respectively.</p> <p>The relation between static pressure with depth is very important to determine fluid contact.</p>			

Module 23

Code	Course/Module Title	ECTS	Semester
PHTH225	Physics and Thermodynamic	6	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
4	2	93	57
Description			
<ul style="list-style-type: none"> - Covers fundamental principles, concepts, and applications of work, energy, and power; motion; thermodynamic; fluid mechanics. and renewable energy. Uses equations to analyze and solve problems. - Thermodynamics is the branch of physics that deals with the relationships between heat and other forms of energy. In particular, it describes how thermal energy is converted to and from other forms of energy and how thermal energy affects matter. This course covers principles of classical thermodynamics. Develops understanding of mass, energy, heat, work, efficiency, ideal and real thermodynamic cycles and processes. It also covers first and second laws of thermodynamics, perfect gas law, properties of real gases, and the general energy equation for closed and open systems. 			

Module 24

Code	Course/Module Title	ECTS	Semester
HURD226	Human Rights and Democracy	3	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	1	48	27
Description			
<ul style="list-style-type: none"> - Human rights are the social standards and moral principles that must be available to all human beings. These rights cannot be violated. They are due and inherent to every person simply because they are human. They give all human beings value and dignity, and their basis is justice, freedom and peace. Full knowledge of their contents, borders and ways of guaranteeing them, as the provision for the inclusion of rights in the core of international and national constitutions and covenants does not achieve practical benefit unless effective guarantees are available against the violations they are exposed to over time. - Democracy is the rule of the people by the people and for the people without prejudice to the rights of states, nations and peoples by choosing the mechanisms and forms that suit them. As for its forms and expressions, they are subject to the specificities of nations and peoples and the special circumstances of societies. The essence of democracy is the rule of the people by the people for the benefit of the people, which includes fixed features and elements, the most important of which are: respect for man as an end, not a means, participation in governance by the people, and achieving the satisfaction of the governed. 			

Module 25

Code	Course/Module Title	ECTS	Semester
DREN311	Drilling Engineering I	6	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	3	93	57
Description			
<ul style="list-style-type: none"> • The aim of the course is to provide students with a fundamental understanding of petroleum well drilling procedures, its mechanics, and design methodology. The course gives an overview of drilling rig operations and related equipment; offshore drilling and advanced drilling tools; drill-string design; drill bit technology; drilling hydraulics; drilling mud design; pore pressure and fracture pressure calculations. 			

Module 26

Code	Course/Module Title	ECTS	Semester
WLFE312	Well Logging and Formation Evaluation I	5	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	2	93	57
Description			
<p>A well log is a continuous record of measurements made in a borehole, responding to variations in some physical properties of the rocks through which the borehole is drilled.</p> <p>The data obtained from the logs is considered one of the most important sources of data in petroleum engineering; therefore, the petroleum engineer should be able to understand how these tools work and can be used to evaluate the reservoir qualitatively and quantitatively. Formation evaluation is the application of scientific principles, engineering concepts, and technological innovations in the exploration and prospecting of hydrocarbon resources in geological formations in an environmentally sustainable and responsible manner</p>			

Module 27

Code	Course/Module Title	ECTS	Semester
PREN313	Production Engineering I	4	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	1	63	37
Description			
<p>Production Engineering I define well completion and the type of completion, storage tank types and definition, gathering lines. Type and requirement, type of separator, classification, method to separate, calculation of separator size, coning definition and calculation of critical flow rate, choke performance and calculation of choke performance by different correlations, drill stem test, stimulation, why stimulation, methods of stimulation, candidate rocks for each stimulation methods.</p>			

Module 28

Code	Course/Module Title	ECTS	Semester
REEN314	Reservoir Engineering II	5	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	2	78	47
Description			
<ul style="list-style-type: none"> - This course describes naturally occurring hydrocarbon systems found in the reservoirs as the mixtures of organic compounds that exhibits multiphase over wide ranges of pressures and temperatures. - The effect of phase behavior during the life time of the reservoir on production and recovery will be explained in detail. - The key oil properties, such as bubble point, GOR, FVF, viscosity ... etc, will be studied and how these properties are calculated. - The key gas properties, such as Dew point, Z factor, FVF, viscosity ... etc, will be studied and how these properties are calculated - Miscellaneous data resources to calculated oil and gas properties - The properties of Oil field water include composition, Bw, viscosity, solubility, resistivity, interfacial tension, ...etc. - Gas liquid equilibrium ratio, pressures and composition calculation. 			

Module 29

Code	Course/Module Title	ECTS	Semester
GERM315	Geophysics and Rock Mechanics	5	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
4		63	62
Description			
<p>Topic including information of geophysical methods in general, and their characterization and specifications of properties, introduction to rock mechanics, and related to petroleum engineering. Starting from basic various geophysical principles and methods used in revealing shallow to deep interior of the earth, carry out geophysical surveys and making choice of methods in the exploration of oil and gas, the instrument that use in the field and the ability to collect, analyze and interpret various data. seismic method (refraction and reflection), seismic waves type, theory of elasticity, type of sound wave velocity and how we use it to recognize lithology type, take all the principles and equations that the student need to calculate layers velocity and depth, Finally, the student will have the ability to read final stack seismogram, make structure and stratigraphic interpretation with detect hydrocarbon</p>			

indicators (HCI) (bright, flat and dim) spots.

Module 30

Code	Course/Module Title	ECTS	Semester
NUAN316	Numerical analysis	5	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
4		78	47
Description			
<p>This course introduces numerical methods used for the solution of engineering problems. The course emphasizes algorithm development and programming and application to realistic engineering problems. Students will learn in this course the following: Roots of nonlinear equations, Solutions of systems of linear algebraic equations. Numerical differentiation and integration. Interpolation. Least squares and regression analysis. Numerical solution of ordinary and partial differential equations. Introduction to error analysis. Engineering case studies.</p>			

Module 31

Code	Course/Module Title	ECTS	Semester
DREN321	Drilling Engineering II	6	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	3	93	57
Description			
<p>This course provides a comprehensive overview of the casing design and well cementing processes. This course presents the primary functions of oil well casing, the various types of casing strings used, the procedures used in the design of casing strings. The course also gives an overview of primary objectives of cementing, the test procedures used to determine if the cement slurry and set cement have suitable properties for meeting these objectives, the common additives used to obtain the desirable properties under various well conditions, the techniques used to place the cement at the desired location in the well.</p>			

Module 32

Code	Course/Module Title	ECTS	Semester
WLFE322	Well Logging and Formation Evaluation II	6	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	3	93	57
Description			
<p>Formation evaluation is the application of scientific principles, engineering concepts, and technological innovations in the exploration and prospecting of hydrocarbon resources in geological formations in an environmentally sustainable and responsible manner. It involves detailed and systematic data acquisition, gathering, analysis, and qualitative and quantitative interpretation while applying scientific and engineering principles. It is an ever-growing and evolving field of petroleum engineering.</p> <p>The applications of well-logging tools in formation evaluation should be covered in this course. Furthermore, the modern software such as IP, Tech-log, and Geo-log Should be used in the evaluation</p>			

Module 33

Code	Course/Module Title	ECTS	Semester
PREN323	Production Engineering II	4	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	1	63	37
Description			
<p>define the drive mechanism in natural forces period at the beginning of well life, define the artificial lift type and its requirement for each type, define the gas lift and submersible electrical pump, calculation of natural gas valves, calculation of head number of stages, efficiency and power for ESP, define the inflow performance relationship, types of IPR and cases, define the vertical lift performance, and explain how to use the working charts.</p>			

Module 34

Code	Course/Module Title	ECTS	Semester
REEN324	Reservoir Engineering II	4	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	1	63	37
Description			
<p>Topic including information of gas reservoirs in general, and their characterization and specifications of properties. Starting from basic ideal gas knowledge to real gases then the gases found in reservoirs and how to calculate each property and then calculating the reserves of gas inside each reservoir. And have a basic idea about how to detect these reservoirs and deal with the produced gases afterwards.</p>			

Module 35

Code	Course/Module Title	ECTS	Semester
HASE325	Hazard, Safety, and Environmental	5	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	3	78	47
Description			
<p>The Hazard Recognition course teaches participants the fundamentals of how to identify hazards in the workplace, rate the risk of the hazards identified, and recommend controls to eliminate or minimize the risks of these hazards using various tools developed by safety professionals. From an environmental standpoint, it involves creating a systematic approach to complying with environmental regulations, such as managing waste or air emissions all the way to helping site's reduce the company's carbon footprint.</p>			

Module 36

Code	Course/Module Title	ECTS	Semester
RAPE326	Risk analysis and Petroleum Economics	5	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	2	78	47
Description			
<p>This course deals with identifying, understanding and analyzing risks and developing solutions that reduce risks. The economic structure of the petroleum industry differs strongly from other industries due to the great risks and uncertainty associated with oil and gas projects, coupled with dangerously volatile price levels.</p> <p>In addition, the number of uncertainties in the data utilized in decision-making to invest in petroleum projects is very high, and therefore strongly affects the decision-making processes.</p> <p>Petroleum companies generally make the decision for a certain petroleum project on the base of economic models. And so, to improve the decision-making process and to be able to face modern challenges, it is imperative to develop a robust solution to the petroleum economics model and an assessment of the associated risks.</p> <p>Therefore, this subject provides students' knowledge and related sciences in the oil economy and its impact on the economic life of Iraq and the countries of the world, also international strategy of energy, types of interest, future production of oil and gas evaluation, time value of money, method of engineering decisions.</p>			

Module 37

Code	Course/Module Title	ECTS	Semester
PERE411	Petroleum reservoirs engineering	5	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	2	78	47
Description			
<p>After completing the course, the student will be familiar with the equations and models used to calculate the volume of the original oil and the volume of the product in different ways. He will be familiar with the types of oil reservoirs and water invasion calculations. Thus, he will be able to analyze and understand these important calculations in petroleum engineering and understand the basics of the softwares used in this field.</p>			

Module 38

Code	Course/Module Title	ECTS	Semester
WECO412	Well Control	6	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	3	93	57
Description			
<p>This Course aims to provide an overview of well control and the systems used in the process and to teach the students the impact of well control event, and to understand the need for well control assessment. This course also addresses the different well control and monitoring program.</p>			

Module 39

Code	Course/Module Title	ECTS	Semester
WETE413	Well Testing	5	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	1	63	62
Description			
<p>Analytical solution to diffusivity equation and basis for pressure transient test analysis. Skin and wellbore storage concept. Pressure build up and flow tests. Estimating average drainage area pressure. Type curve as diagnostic tools and as an analysis technique. Analysis of well tests in hydraulically fractured wells. Well test behavior in naturally fractured reservoirs. Multiple well testing, interference and pulse test. Well test design</p>			

Module 40

Code	Course/Module Title	ECTS	Semester
NAGE414	Natural Gas Engineering	4	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	1	48	52
Description			
<p>This course deals with the understanding, learning and solving problems of producing, processing and transporting of natural gas from porous media at which it forms to consumers with large quantity and</p>			

less losses or costs.

Module 41

Code	Course/Module Title	ECTS	Semester
INRM415	Integrated Reservoir Management I	6	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	3	93	57
Description			
<p>The course is designed to clarify how the integrated and the sound reservoir management is the key to realize an effective development plan and a successful operation throughout the reservoir's life. It will also provide the principles to manage the reservoirs and enhance the recovery from the remaining oil & gas-in-place. The successful applications of these reservoir management concepts will lead to achieve high recovery factors. In addition, the course provides many tools and techniques to help address the challenges of providing a more reliable and sound reservoir engineering and management.</p>			

Module 42

Code	Course/Module Title	ECTS	Semester
ENPR416	Engineering project	4	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	63	37
Description			
<p>Final Year Projects represent the culmination of study towards the Bachelor of Engineering degree. Projects offer the opportunity to apply and extend material learned throughout the program. Assessment is by means of a seminar presentation, submission of a report, and a public demonstration of work undertaken. In contrast to the majority of courses studied elsewhere in the program, projects are undertaken individually or in small groups. This necessarily introduces the dimension of workload management into the program to enable completion of a large, relatively unstructured "assignment" over the course of two semesters. The projects undertaken span a diverse range of topics, including theoretical, simulation and experimental studies, and vary from year to year. The emphasis is necessarily on facilitating student learning in technical, project management and presentation spheres. This course consists of a combination of term 1 and term 2 which reflects the</p>			

full year multi term sequence program. As it is a single course of 30 units in two semesters, approval by the Course Coordinator is required before enrolling in this course.

Module 43

Code	Course/Module Title	ECTS	Semester
DDWD421	Directional drilling and Well Design	5	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	2	78	47
Description			
<p>This Course aims to provide a knowledge and skills necessary for directional and horizontal well design. The course also enables students to understand the operations carried out by directional drilling. They will also learn how to contribute to the design of directional and horizontal wells. The course will cover the fundamentals, design considerations, and operational aspects of directional and horizontal drilling.</p>			

Module 44

Code	Course/Module Title	ECTS	Semester
WOWS422	Workover and Well Stimulation	5	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	1	63	63
Description			
<p>Introduction to workover operations. Procedures of well interventions. Types of well interventions. Workover units for land operations. Coiled tubing operations. Slickline operations. Sand control and mitigations. Completion systems and pressure drop. Formation damage. Pseudo-skin factor. Perforation design. Stimulation by acidizing. Stimulation by hydraulic fracturing.</p>			

Module 45

Code	Course/Module Title	ECTS	Semester
IMOR423	Improved Oil Recovery	5	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	1	63	62
Description			
<p>This course provides a basic mechanism of oil production (primary, secondary, and tertiary recovery). We discuss, in detail, the concept of miscible gas, chemical, thermal, and water flooding. We discuss the review of fundamentals of reservoir engineering, primary recovery, review of secondary depletion, displacement efficiency, Buckley-Leverett theory, mobility ratio, sweep efficiency, well placement, water flood evaluation; Introduction to EOR, recovery factor, capillary number; Immiscible gas displacement and displacement efficiency.</p>			

Module 46

Code	Course/Module Title	ECTS	Semester
RESI424	Reservoir Simulation	5	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	2	78	47
Description			
<p>The course gives the theoretical basis and practical fundamentals for the mathematical modelling and numerical simulation of fluid flow in petroleum reservoirs. The governing laws and equations required for the modelling of single-phase</p>			

Module 47

Code	Course/Module Title	ECTS	Semester
INRM425	Integrated Reservoir Management II	6	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	3	93	57
Description			
<p>The course is designed to clarify how the integrated and the sound reservoir management is the key to realize an effective development plan and a successful operation throughout the reservoir's life. It will also provide the principles to manage the reservoirs and enhance the recovery from the remaining oil & gas-in-place. The successful applications of these reservoir management concepts will lead to achieve high recovery factors. In addition, the course provides many tools and techniques to help address the challenges of providing a more reliable and sound reservoir engineering and management.</p>			

Module 48

Code	Course/Module Title	ECTS	Semester
ENPR426	Engineering project	4	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	63	37
Description			
<p>Final Year Projects represent the culmination of study towards the Bachelor of Engineering degree. Projects offer the opportunity to apply and extend material learned throughout the program. Assessment is by means of a seminar presentation, submission of a report, and a public demonstration of work undertaken. In contrast to the majority of courses studied elsewhere in the program, projects are undertaken individually or in small groups. This necessarily introduces the dimension of workload management into the program to enable completion of a large, relatively unstructured "assignment" over the course of two semesters. The projects undertaken span a diverse range of topics, including theoretical, simulation and experimental studies, and vary from year to year. The emphasis is necessarily on facilitating student learning in technical, project management and presentation spheres. This course consists of a combination of term 1 and term 2 which reflects the full year multi term sequence program. As it is a single course of 30 units in two semesters, approval by the Course Coordinator is required before enrolling in this course.</p>			

Contact

Program Manager:

John Smith | Ph.D. in Biology | Assistant Prof.

Email:

Mobile no.:

Program Coordinator:

John Smith | Ph.D. in Biology | Assistant Prof.

Email:

Mobile no.:
