A'Sharqiyah University

College of Engineering

Department of Energy and Sustainable Engineering

Diploma in Environmental Engineering Program

Course Descriptions

University Requirements (12 CH)

ISLM101 Islamic Civilization (3 CH)

This course aims to introduce students to the concept of civilization, the composition and evolution factors, introduce them to the most important political and administrative systems and economic and social development in the Islamic civilization, and aims to the statement of contributions to Islamic civilization in other civilizations, especially the European civilization, also aims to publicize the importance of the site Oman and how to interact with other previous civilizations in different eras, and the factors that allowed it to be a center of cultural divisions history.

ENGL101 English Communication Skills I (3 CH)

This course develops students' proficiency through grammar instruction and fluency exercises. While the emphasis of the class is on speaking and listening, there are also reading and writing exercises which reinforce the grammar and vocabulary students learn. Finally, students are required to participate in discussions regularly basis and give several presentations.

ENGL102 English Communication Skills II (3 CH) (Pre-R: ENGL101)

This course further develops reading sub-skills, comprehension, and vocabulary. The texts are more demanding lexically and structurally than ENGL101 and are mainly literary. Written and oral activities require students to respond to these texts critically.

MNGT313 Entrepreneurship (3 CH) (Pre-R: 60 CH)

This course is an introductory course in Entrepreneurship and Innovation. The course aims to expose students to business venturing and entrepreneurial activity. The students would apply knowledge and skills acquired during the course by developing and evaluating their business ideas. This course is an introductory entrepreneurship course that focuses on the vital role played by entrepreneurs and entrepreneurship in the 21st-century global economy. The process of successfully launching and growing an entrepreneurial venture by applying the entrepreneurial process is examined. The course integrates several different disciplines, ranging from sociology and psychology to economics, finance, marketing, and human resource management. It is a course that mixes theory with practice by applying principles, concepts, and frameworks to real-world situations.

College Requirements (30 CH)

ENGR111 Computer Applications (3 CH)

The course teaches students how to use MATLAB and visual basic programming languages in a numerical computing and integrated development environment. The topics covered in the course include using variables, solving problems, data analysis functions, manipulating matrices, plotting, data presentation, logical operators, flowcharts, pseudocode, selection structures, and an introduction to Visual Basic programming language with its applications.

MATH101 Calculus I (3 CH)

The aim of this course is to lay a firm foundation for students in calculus. The course will introduce students to the concepts of limits, continuity, derivatives, hyperbolic functions and integrals. It will develop mathematic critical thinking and problem-solving skills.

PHYS101 Physics I (3 CH)

This course presents concepts and methodologies for understanding physical phenomena. Topics include kinematics, Newton's laws, work and energy, the universal law of gravitation, systems of particles, rotational motion, momentum, angular momentum, mass and energy conservation laws, thermodynamics, vibrations and waves, oscillations, and transverse waves.

CHEM101 Chemistry (3 CH)

This course presents the basic concepts and methodologies for understanding chemical phenomena. Stoichiometry of chemical reactions, quantum mechanical description of atoms, the elements and periodic table, chemical bonding, real and ideal gases, thermochemistry, introduction to thermodynamics and equilibrium, introduction to chemical kinetics, acid-base and solubility equilibria, introduction to oxidation-reduction reactions.

MATH102 Calculus 2 (3 CH) (Pre-R: MATH101)

The aim of this course is to lay a firm foundation for students in calculus. The course will introduce students to the concept's definite integrals, integration by substitution, integration by parts, sequences and series. This course also introduces students to the concepts of vector and scalar product, partial derivatives, solution of first-order ODE's and PDE's.

PHYS102 Physics 2 (3 CH) (Pre-R: PHYS101)

This course presents introduction to electricity, magnetism, electromagnetic waves, optics, and modern physics. Topics include Coulomb's Law, electric fields, Gauss' Law, electric potential, capacitance, circuits, magnetic forces and fields, Ampere's Law, induction, Maxwell's equations, electromagnetic waves, and geometrical optics.

ENGR201 Engineering Drawing (3 CH)

This course provides basic knowledge and skills of engineering drawing so that students can efficiently develop engineering plans and details. Main topics include freehand sketching, principles of orthographic projection, dimensioning, section, isometric and working drawings, 2D and 3D drawings using AutoCAD.

ENGR202 Technical Writing and Presentation (3 CH) (Pre-R: ENGL102)
The objectives of this course are to develop engineering students' abilities to improve the communication skills and specialist language knowledge of engineers; to listen to and speak about engineering-related situations; to ask and answer important engineering-related questions; and to present engineering projects in an engaging and convincing format.

MATH215 Linear Algebra (3 CH) (Pre-R: MATH101)
The course aims to introduce students to different methods of solving systems of linear equations using matrices and to teach the representation of geometric transformations through matrices. The course covers topics such as the algebra of matrices and vector spaces, as well as applications of matrices to solutions of systems of linear equations and geometric transformations.

MATH204 Probability and Statistics (3 CH) (Pre-R: MATH102)
Basic concepts of descriptive statistics, statistical inference, regression, correlation analysis, hypotheses test, and confidence intervals, elements of set theory, sample space and events, probability, conditional probability and independence, examples of discrete and continuous probability distributions, multivariate probability distributions, functions of random variables, and central limit theorem.

Program Requirements (35 CH)

ENGR110 Engineering Laboratories (3 CH)
The course aims to introduce students to the core disciplines of civil engineering such as transportation engineering, structural engineering, materials engineering, environmental engineering, geotechnical engineering, and thermo-fluids engineering. The course includes laboratory sessions in each of these disciplines, where students will conduct experiments related to structures and materials, environmental engineering, transportation engineering, and thermofluids.

CVEN310 Surveying (3 CH) (Pre-R: MATH101)
The course focuses on teaching students the fundamentals of measuring distance, elevation, and angles using surveying instruments, as well as determining areas and volumes. Additionally, the course covers the setting out of construction works and introduces students to GPS and GIS. The course includes intensive field work to provide hands-on experience to the students.

ENEN301 Environmental Chemistry (3 CH) (Pre-R: CHEM101)
This course discusses the basic chemical aspects of environmental engineering. Topics covered include inorganic chemistry, chemical kinetics, acid- base chemistry, oxidation- reduction, precipitation dissolution, element of organic chemistry and thermodynamics of chemical reactions.

ENGR220 Statics (3 CH) (Pre-R: MATH101)
The course aims to help students apply their knowledge of mathematics and science to understand the basic principles of mechanics and apply them to solve a wide range of engineering problems. Topics covered in the course include vector operations, free body diagrams, moments, distributed loads, truss analysis, centroids, center of gravity, composite bodies, composite areas, radius of gyration, and Mohr's circle.

CVEN232 Engineering Geology (2 CH) (Pre-R: CHEM101)
The course focuses on the study of the earth's structure, including rocks, sediments, and geological structures. It also covers the use of rocks in construction and mapping techniques. Additionally, the course includes the study of soil, groundwater, and rivers, with a focus on their relevance to civil and environmental engineering.

ENEN201 Renewable Energy (3 CH) (Pre-R: MATH102)
In this course, students will receive an overview of underlying technological principles of renewable energy including solar energy, biomass, hydro, wind, wave tidal, and geothermal energy sources. Students will gain an understanding of some techniques involved in the analysis of the economics of renewable energy.

CVEN361 Environmental Engineering (3 CH) (Pre-R: CHEM101)
This course teaches environmental science from engineering approach. It covers an introduction to environmental engineering, water pollution, air pollution, soil contamination, hazardous and solid waste.

CVEN302 Environmental Microbiology (3 CH) (Pre-R: CHEM101)
This course discusses the basic biological aspects of environmental engineering. Topics covered include microbial cells and their metabolic capabilities, microbial genetics and their potentials, growth of microbes and kinetics of growth, microbial ecology and diversity, the microbiology of wastewater treatment, probing of microbes, public health microbiology, and pathogen control.

ENGR321 Dynamics (3 CH) (Pre-R: ENGR220)
This course focuses on the fundamental principles of engineering mechanics with a focus on dynamics. Topics covered in the course include the kinematics and kinetics of a particle, work and energy, and impulse and momentum.

CVEN332 Civil Engineering Materials (3 CH) (Pre-R: ENGR110)
This course introduces students to geology and its impact on the design and construction of civil engineering constructed facilities. Students will learn about the engineering elements of rocks and geologic processes from an engineering perspective.

ENEN422 Environmental Measurements (3 CH) (Pre-R: ENEN301)
The course focuses on teaching students the fundamentals of measuring distance, elevation, and angles using surveying instruments, as well as determining areas and volumes. Additionally, the course covers the setting out of construction works and introduces students to GPS and GIS. The course includes intensive field work to provide hands-on experience to the students.

ENGR301 Managing Engineering Organization (3 CH) (Pre-R: ENGR202)
This course introduces students to the roles and functions of managers. The content includes an introduction to engineering organizations and the need and nature of management. It examines the evolution of management theory, organizational environmental, corporate social responsibility and business ethics. The course also includes a detailed investigation of the functions of management: planning and decision making, organization, leadership and human motivation, and control.