دبلوم العلوم البيئيه والتنميه الصناعية

Diploma of Environmental Science and Industrial Development

دبلومة الدراسات البيئيه والتنميه الصناعيه هى دبلومة مصممه لتحقيق المعرفيه البيئيه المطلوبه للعاملين بمجالات مختلفه. الدبلومه تتكون من عدة محتويات مختلفه لتغطية المعرفة المطلوبه فى مجال البيئه. الدبلومه تمنح الدارسين البيئه التنافسيه العاليه ما بين محتويات دراسيه متنوعه و مهارات عمليه مختلفه لتخريج دارس ذو خلفيه جيده فى مجال البيئه وتطبيقاتها سواء الطبيعيه او التكنولوجيه فى مجال الصناعه.

الأهداف ومخرجات التعلم المقصودة:

1. جذب أصحاب التخصصات المختلفه الى تنميه المعرفه البيئيه.
2. تأهيل الدراسين بالمعلومات الاساسيه والمهارات المطلوبه فى مجال علوم البيئه وتطبيقاتها.
3. تغطيه عدة جوانب مختلفه لتتطابق مع الخلفيه العلميه للدارسين.
4. تأهيل الدارس لتطبيق ما تعلمه من علوم البيئه فى مجال عمله.
5. تأهيل الدراسين الى دراسات أكثر تخصصا فى مجالات علوم البيئه المختلفه.

Program Courses

1. Compulsory Courses:

First Semester							
Course code	Course title		Total Credit Hours	Lecture Credit Hours	Lab Credit Hours	Exam Duration (hour)	Final grades out of
	English	Arabic					
EN501	Environmental chemistry and analysis	التحليل الكيميائى والبيئى	3	2	1	2	150
EN502	Ecology	علم البيئة	3	2	1	2	150
EN503	Fundamentals of Air Pollution Control	أساسيات التحكم فى تلوث الهواء	3	2	1	2	150
EN504	Environmental Economics	إقتصاد بيئى	1	1	0	1	50
EN505	Clean Water Technology	تكنولوجيا المياه النظيفة	1	1	0	1	50
EN506	Solid and Hazardous Waste Management	ادارة المخلفات الصلبة والخطرة	2	2	0	2	100
EN507	Plant design	تصميم مصنع	1	1	0	1	50
Second Semester							
Course code	Course title		Total Credit Hours	Lecture Credit Hours	Lab Credit Hours	Exam Duration (hour)	Final grades out of
	English	Arabic					
EN511	Water Reclamation Technology	تكنولوجيا تجميع المياه	1	1	0	1	50
EN512	Environmental Legislative Framework and Methods of Enforcement	أساسيات التشريعات البيئية وطرق العقوبات	1	1	0	1	50
EN513	Workplace safety and health	السلامة و الصحة المهنية	1	1	0	1	50
EN514	Fundamentals of Oilfield Processing	أساسيات تجهيز حقول النفط	2	2	0	2	100
EN515	Environmental management system	نظام الادارة البيئية	1	1	0	1	50
EN516	Industrial wastewater technology	تكنولوجيا مياه الصرف الصناعى	1	1	0	1	50

EN517	Practical environmental analysis	مقرر عملى تحليل بيئى	3	2	1	2	150

2. Elective courses:

Elective Courses							
Course code	**Course title**		**Total Credit Hours**	**Lecture Credit Hours**	**Lab Credit Hours**	**Exam Duration (hour)**	**Final grades out of**
	English	**Arabic**					
EN508	Membrane science and technology	علوم وتكنولوجيا الأغشية	2	2	0	2	100
EN509	Basic hydraulic	الهيدروليكية الأساسية	2	2	0	2	100
EN510	Risk Management	ادارة المخاطر	2	2	0	2	100
EN518	Basics of Nano technology	أساسيات علم النانو	2	2	0	2	100
EN519	Energy conservation management	ادارة الحفاظ على الطاقة	2	2	0	2	100
EN520	Process instrumentation and control	الاجهزة العملية والتحكم	2	2	0	2	100

For graduation you should complete total credit hours = 28

[Compulsory Courses (24 credit hours) + Elective Courses (4 credit hours)]

Course Specifications

EN501 Environmental Chemistry and Analysis

This course introduces graduates to the field of environmental chemistry and provides a foundation for applications in pollution control and water & wastewater technology. Graduates will study the practical aspects of environmental chemistry, quantitative measurements, and analysis of air, water, and wastewater. Principles of measurement, instrumentation, and analysis are emphasized using an application-oriented approach.

EN502 Ecology

Ecology is the study of living things in their natural environment. This module focuses on the significance and function of natural ecosystems, and how humans have affected these systems over time. It concentrates on the interaction between human activities, resources, and the environment. As the human population grows and technology advances, pressures on earth's natural systems are becoming increasingly intense and complex. This module aims to promote greater environmental awareness and nurture social responsibility towards the environment.

EN503 Fundamentals of Air Pollution Control

Introduction to air pollution. Chemistry of air pollution. Effects of air pollution. Air pollutants from industrial processes. Transport of air pollutants. Indoor air pollution. Air pollution measurements and analytical techniques. Air pollution laws and regulations, and the emission standards. Air pollutant concentration models. Air pollution control. Future of air pollution.

EN504 Environmental Economics

This course aims at equipping students with economic methods and tools to analyze basic environmental issues while strengthening group work skills. This course combines theoretical analysis with discussions on specific environmental policies as applied to water,

air pollution, energy, climate change, and human health issues. Within these examples, particular topics that will be covered are the concepts of sustainability, microeconomic analysis of environmental regulation, the problem of social cost, policy instrument choice, and estimating costs and benefits of environmental improvements via revealed preferences (hedonic analysis, travel cost method, household production) or stated preferences.

EN505 Clean Water Technology

This module introduces the processes for treating raw water from various surface water sources to produce potable water. Graduates will study raw water quality parameters, treatment techniques, and the monitoring and operation of water treatment systems. The focus is on conventional water treatment technologies emphasizing on chemical coagulation and flocculation processes for removal of suspended and colloidal solids in raw water. Topics covered include pre-treatment of raw water, sedimentation, coagulation, flocculation, filtration, and disinfection techniques.

EN506 Solid and Hazardous Waste Management

Graduates will examine how solid and hazardous waste is generated; the pollution problems related to waste disposal; and methods of collection, handling, treatment, and disposal of waste. Concepts of waste minimization such as recycling, reusing, reducing, and waste exchange will be highlighted as effective tools in waste management. Issues in biomedical waste generation, collection, and treatment will be addressed. Local legislation for solid and hazardous waste will be explained in relation to the overall waste management practice.

EN507 Plant Design

A study of the engineering aspects involved in the development of an industrial plant. Capital and manufacturing cost estimates. Safety in design. Feasibility survey. Equipment design and specification. Plant layout and location. Students will work in small groups to produce a process design and economic evaluation of a complete industrial plant. The

students will learn:

- Plant layout fundamentals and work flow procedures
- Terminology and symbols used in plant layout
- Fundamental principles of chemical process technology
- Process flow diagrams (PFDs)
- Equipment used in process plants
- Instrument symbols and abbreviations
- Piping and instrumentation diagrams (P&IDs)
- Piping design and engineering principles
- Terminology, symbols and abbreviations used in piping design
- Piping specifications and piping codes
- Components of piping systems - fittings, flanges and valves
- Piping isometrics and bill of materials.

EN508 Membrane Science and Technology

This module aims to equip graduates with fundamental knowledge of membrane science and membrane applications in environmental engineering. Topics covered in this module include the types of membranes and membrane modules, the basic principles of membrane fabrication, general theory of membrane transport, membrane separation process, membrane fouling, liquid membranes, and facilitated transport. Membrane applications in water reclamation recycling and reuse will also be covered.

EN509 Basic Hydraulic

Graduates will examine the basic hydraulic principles and fundamental concepts that are essential for the study of water and wastewater technologies. Topics covered include the properties of fluid, manometry, hydrostatics, and fundamental principles of fluid flow. Head loss in pipeline, design of pipeline, flow measurements, and pipe network analysis will also be covered. Graduates will also learn about open channel flow and the design of surface water drainage system.

EN510 Risk Management

What is risk management? Why accidents occur. How to avoid accidents. The consequences. Personnel health and safety. Process safety analysis. Loss prevention. Process safety in design and operations. Defining and quantifying risk. Checklists. Hazard and operability analysis (HAZOP) studies. Hazard analysis (HAZAN) techniques. Human factors. Linking HAZOP, process control, instrumentation and alarm systems. Cost of plant safety. Environmental impact. Case studies of serious plant accidents.

EN511 Water Reclamation Technology

Graduates will explore the fundamentals of collection systems for wastewater from domestic premises, wastewater treatment techniques, monitoring and operation of wastewater treatment systems, and the code of practice relevant to sewerage and sewage treatment. The design of sewer collection systems will also be covered in detail. Emerging technologies in water reclamation and water recycling will be emphasized in this module

EN512 Environmental Legislative Framework and Methods of Enforcement

Structural: Bridges roads towers power pylons -Transportation: Roads traffic control airports -Water: Dams pipelines purification works reservoirs -Geotechnical: Foundations excavations and fills-Urban: Municipal services development and maintenance of towns - recreational facilities -Construction: Construction management-Environmental: Impact studies social and natural environments harmonising affected elements and resources.

EN513 Workplace Safety and Health

This module focuses on the study of various aspects that are critical to the provision of a safe working environment. Topics covered include toxicology, clean air and ventilation, control of temperature and humidity, industrial hygiene and industrial diseases.

EN514 Fundamentals of Oilfield Processing

Introduction to Oilfield Processing. Measurement. Instrumentation. Relief systems. Storage. Multiphase flow calculations in pipe lines. Separator design and sizing of flow lines. Pumps and Hydraulic Turbines. Hydrate formation and remedial options. Prime mover for mechanical derive. Hydrocarbon Recovery. Utilities in upstream processing. Dehydration and hydrocarbon treating. Compressors, Expanders and Refrigerators. Utilities in upstream processing. Dehydration and hydrocarbon treating.

EN515 Environmental Management System

In this course, graduates will learn the application of concepts and principles in environmental management. Topics covered include the fundamentals of environmental impact assessment (EIA), environmental baseline studies (EBS), risk assessment, environmental management systems (EMS), ISO 14001, OSHA 18001 and environmental auditing.

EN516 Industrial Wastewater Technology

Different industrial processes result in unique type and characteristics of industrial wastewater. Considering specific pollutants and toxic substances, treatment methodology applicable for conventional domestic wastewater is not all together applicable for industrial wastewater. This module introduces graduates to specific industrial wastewater problems and addresses possible unit processes applicable to industrial wastewater treatment. These unit processes, along with conventional water pollution treatment techniques, can then be applied as a complete treatment flow for different industrial wastewater types. The module will cover basic physical, chemical, and biological treatment technologies and also highlight specific industrial wastewater treatment methods and anaerobic treatment applications.

EN517 Practical environmental analysis

- Classical analysis
- Water analysis
- Cement analysis
- Instrumental analysis

EN518 Basics of Nano technology

Introduction to nanoscience – definition of nanomaterials and nanoscale – preparation methods – characterization and application.

EN519 Energy conservation management

Energy consumption is at an all-time high, and it is uncertain how high energy costs will go. This module will teach graduates energy conservation efforts and innovative programs to help people, including businesses, get in the habit of using energy more efficiently, thereby saving money, energy and the environment.

EN520 Process instrumentation and control

Graduates will study the principles and applications of process instruments and the fundamentals of automatic process control systems, which include the basic concepts of analogue and digital control, principles of feedback and loop stability. The module includes a site visit to a control plant to enhance student learning.