دبلوم كيمياء وتكنولوجيا صناعة الأسمنت
Diploma of Cement Chemistry and Technology

تم تصميم برنامج دبلوم كيمياء وتكنولوجيا صناعة الأسمنت بشكل يفيد الطالب بوسائل المعرفة المتطورة ومهارات الأبتكار و التصميم الفكري مما سيكون له عائد مباشر وغير مباشر على صناعة الأسمنت والبيئة في مصر والشرق الأوسط. كما يهدف البرنامج لدعم التحديث والخبرات المطلوبة لفرص عمل في مجالات واسعة بما فيها صناعة الأسمنت والتنمية البيئية.

الأهداف ومخرجات التعلم المقصودة:

1. أن يصبح الخريج ملماً بالمعارف والمفاهيم العلمية والعملية الأساسية الخاصة بصناعة الأسمنت والتنمية البيئية.
2. أن يكون الخريج قادرا على التعامل مع تقنيات صناعة الأسمنت واستخدام الأجهزة الخاصة لهذا الغرض.
3. أن يقدم خريجا قادرا على التميز في سوق العمل وبخاصة فى مجال كيمياء وتكنولوجيا صناعة الأسمنت والمراكز المهتمه بذلك.
4. ترسيخ قواعد الممارسات الامنة داخل المعامل والإهتمام بالصحة والسلامة المهنية.
5. تأهيل كفاءات قيادية، فنية وأكاديمية، في مجال الصناعة تسهم في نشر الوعي البيئى بين أفراد المجتمع.
6. تطبيق أساليب ادارة الجودة الشاملة فى التصنيع والانتاج لصناعة الاسمنت.
7. تأهيل الدارسين المتميزين بالمضي قدما في مجال البحث العلمي والحصول على الشهادات العليا في هذا المجال.
8. أن يتمتع الخريج بالقيم والمعتقدات التي تتناسب مع أخلاقيات مجتمعنا العربى ومتمشيا مع قوانينه النافذة.

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					
CT501	Environmental Impact Assessment of Cement Industrial	تقييم الأثر البيئي لصناعة الاسمنت	2	2	0	2	100
CT502	Health, Safety & Environmental Management	الصحة والسلامة و الإدارة البيئية	2	2	0	2	100
CT503	Fundamentals of Air Pollution Control	أساسيات التحكم في تلوث الهواء	3	2	1	2	150
CT504	Instrumental Analysis	تحليل أجهزة	3	2	1	2	100
CT505	Kiln Process Operation and Control	التشغيل والتحكم فى الفرن	2	2	0	2	100
CT506	Chemistry and Production of Cement	كيمياء وانتاج الاسمنت	1	1	0	1	50
CT507	Industrial waste	مخلفات صناعية	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					
CT511	Cement Plant Instrumentation and control	أجهزة وتحكم مصنع الأسمنت	1	1	0	1	50
CT512	Cement and Environmental effect	الاسمنت و الأثر البيئي	3	2	1	2	1500
CT513	Dedusting Equipment and cement standards	أجهزة إزالة الغبار و معايير الاسمنت	1	1	0	1	50
CT514	Environmental Legislative Framework and Methods of Enforcement	الإطار التشريعي البيئي وطرق تنفيذ	1	1	0	1	50

CT515	Mining, Mineral Processing and Cement	المعادن تعدين ومعالجة وألاسمنت	2	2	0	2	100
CT516	Principles of Environmental Risk Management	اساسيات إدارة المخاطر البيئية	2	2	0	2	100

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**					
CT508	Civil Liability in Relation to Environmental Pollution	المسؤولية المدنية الخاصة بالتلوث البيئي	2	2	0	2	100
CT509	Environmental civil engineering	الهندسة المدنية البيئية	2	2	0	2	100
CT510	Economic of cement	اقتصاد الاسمنت	2	2	0	2	100
CT517	Energy conservation management	إدارة توفير الطاقة	2	2	0	2	100
CT518	Monitoring and operation of wastewater treatment	رصد وعملية معالجة مياه الصرف	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

CT501 Environmental Impact Assessment of Cement Industrial

The EIA process should proceed through a number of steps:

- Description of the project: What type of projects, its size, components, and processes expected, all stages of implementation?
- Screening: is an EIA required?
- Scoping, or identification of potential environmental impacts: What has to be covered in the formal EIA and in what detail?
- Baseline: What are the existing environmental conditions? - Prediction: What environmental impacts will the project have? - Evaluation: How will these impacts affect people and resources, and how significant are the resulting effects?
- Mitigation: Can significant negative effects be avoided or made acceptable? Can benefits be enhanced?

CT502 Health, Safety & Environmental Management

Criteria for evaluating the significance of impacts, Health, Safety & Environmental Management, and their effects should be set in advance. They should be based on local standards wherever possible. Where these are not available, acceptable international standards should be used (e.g. WHO, US EPA, etc. guidelines).

CT503 Fundamentals of Air Pollution Control

Air pollutants. -Effects on human beings and environ. Sources of air pollutants - Pollutant concentration and emission – measurements - Chemistry in the atmosphere. Dispersion of pollutants in the atmosphere - Regulations and laws - General Ideas in Air Pollution Control-A better process design-After-treatment processes - Alternative approaches - Control mechanisms. Size distributions - Wall collection devices - Dividing collection

devices - Gas control –Incineration-Regional and Global Issues-Global warming - Stratospheric ozone depletion. Acid rain.-Long-range transport-Hazardous air pollution-Urban smog-Indoor air pollution.

CT504 Instrumental Analysis

Introduction to Instrumental analysis-Radiation and Bioradiation-IR, UV, NMR, MS, and electronic microscope (Scanning and transmittance) –electrophoresis –spectrophotometer and HPLC devices

CT505 Kiln Process Operation and Control

The Course contents: Process and kiln system, Basic principles of operation. Chemical Reactions in the Kiln. Kiln Zones, Raw Material characteristics. Liquid Phase and importance of Iron and Aluminum content, Fuel types and their characteristics, Combustion Theory, Calciner Operation, Calciner Fuels, Heat Balances. Heat Balance work session, Optimization of heat consumption, Behavior of volatile matter. Volatile matter work session, Clinker coolers, Operations, and optimization of clinker coolers, Emissions of NOx and SOX from cement kilns. New emission standards, Starting, and Stopping the kiln.

CT506 Chemistry and Production of Cement

The production of cement takes place with several steps:

- Quarrying of limestone and shale
- Dredging the ocean floor for shells
- Digging for clay and marl
- Grinding, Blending of components
- Fine grinding, Burning, Finish grinding, Packaging and/or shipping.

CT507 Industrial waste

The aim of the course is to study wastes from industries, characterization of waste stream, management of industrial wastewater, source reduction, treatment and disposal of solid wastes, methods for treating air discharges and the technologies for waste treatment. Provide the student with the skills required for management of industrial waste.

CT508 Civil Liability in Relation to Environmental Pollution

Civil liability resulting from environmental damage: an international and comparative law overview- Technical and scientific co-operation -National substantive law: overview of the principal judicial means for obtaining reparation for damage resulting from environmental pollution in common law and in civil law -The conflict of laws in the field of environmental liability- Legislative cooperation -The environmental disaster: a mass tort litigation.

CT509 Environmental civil engineering

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.

CT510 Economic of Cement

Feasibility studies, cash flow, balance sheet, return on investment, decision making, opportunity cost, interest rate to review the future money value, currency exchange

CT511 Cement Plant Instrumentation and Control

Graduates will study the principles and applications of process instruments and introduction to Instrumental Analysis-Radiation and Bioradiation-IR, UV, NMR, MS, and

electronic microscope (Scanning and transmittance) –electrophoresis –spectrophotometer and HPLC devices. Software control, control room operation, auto pilot (expert optimizer, other simulation programs) flow meters, weight feeders calibration, belt scales.

CT512 Cement and Environmental Effect

Description of the cement industry- Pressures on the environment- Resource use- Emissions to air- Discharges to water- Waste production and management- Transport- Pollution incidents and prosecutions- Noise, vibration, odor and aesthetics- Standards of environmental management- Environmental Impacts.

CT513 Dedusting Equipment and Cement Standards

The main sources of dust emissions in the cement industry. Sources of emissions in particular disorganized emissions also include all sorts of feeding devices, packaging installations and silos. Type of technological installation, types of equipment used for dedusting in the cement industry. Electro filters and, Bag (fabric) filters. Cement standards according to (Egyptian standards 1-4756/2007).

CT514 Environmental Legislative Framework and Methods of Enforcement

Principles of health and safety management. Loss causation and incident investigation. Identifying hazards. Assessing and evaluating risk. Risk control and emergency planning. Organizational factors. Human factors. Principles of health and safety law. Criminal law. Civil law. Measuring health and safety performance. General aspects of occupational health and hygiene. Principles of toxicology and epidemiology. Evaluating risk from chemical agents. Preventive and protective measures concerning hazardous substances.

CT515 Mining, Mineral Processing and Cement

Mine-Wide Optimization: Extraction ,Transportation and Conveyance, -Crushing and grinding, -Different quarries with simple geological basis knowledge and quarry managements

CT516 Principles of Environmental Risk Management

Concepts and principles underpinning Environmental Risk Assessment and Management, including aspects such as Hazard, Harm, Risk, Pollution, etc., in the context of the principles of Sustainability.-Understanding what 'a risk-averse and cautious approach' entails-Tools and Guidelines for Risk Assessment-Multi-Criteria Decision Making and Risk Management Planning-Practical Case Study – Risk Assessment for Mine Closure-Risk assessment provides a systematic procedure for predicting potential risks to human health or the environment.

CT517 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.

CT518 Monitoring and Operation of Wastewater Treatment

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.