ARAB ACADEMY FOR SCIENCE, TECHNOLOGY
AND MARITIME TRANSPORT

COLLEGE OF ENGINEERING
AND TECHNOLOGY

(GRADUATE STUDIES)

Master of Science Programs

STATUS REPORT

ALEXANDRIA

2012

CONSTRUCTION AND BUILDING ENGINEERING

M.SC. PROGRAMS

M.Sc. in Construction and Building Engineering

OVERVIEW

Construction is one of the largest nation's industries, encompassing an incredibly wide range of activities, from high-rise buildings construction to homes, from highways to power plants. Indeed modern construction projects have become so large, complex, expensive and time-consuming that special educational programs now are being offered to prepare students for entry into this important and challenging industry.

The mission of the Construction and Building Engineering Department at the AASTMT is to provide the educational, research, and training programs that serve both the needs of our students and those of the construction industry. The curriculum objective is to prepare individuals for a professional career in construction engineering and management and for continued learning through post-graduate education or self study.

The department offers a B.Sc., a diploma, and a Master's degree in Construction Engineering. As a student in construction engineering, you will learn to identify the best methods and techniques of construction, to determine construction costs and set schedules, to apply methods of quality control and to supervise construction projects.

The program is designed to prepare our students to become outstanding construction engineers, whose job is to devise and design construction facilities, coordinate and direct the efforts of labor and equipment, and control the time and cost demands of field operations.

As they gain experience, construction engineers become construction managers who combine engineering, management, and field construction skills in the administration and management of field construction.

Graduates of the Construction and Building Engineering degree program design and manage construction processes that create living and working environments such as office buildings, industrial buildings, airports, housing, roads, bridges, utilities, and dams. Graduates fill positions in construction companies, engineering consulting firms, government agencies, and large construction corporations. The positions usually involve either the planning, design, and management of the construction process for a general, specialty, or mechanical contractor, or the coordination, inspection, and management of design, contracts, or facilities for a business, industry or government owner.

When you ask top managers in construction and engineering firms why they selected this career, you can hear the excitement of the construction industry in their responses. Some say they like to conceive an idea and then engineer and manage it through to reality. Others say that they like the combination of computerized planning, process design, cost engineering, and scheduling with the gratification of seeing a job well done.

Graduates of this degree program enjoy a wide range of opportunities to apply their technical knowledge with tremendous variety in the day-to-day work. Some choose design, planning, or financial management positions working in an office environment, while others prefer to direct field operations or some combination of the above.

Program Detailed Structure

M.SC. PROGRAM

(B) ENVIRONMENTAL ENGINEERING

M.Sc. in Construction and Building Engineering
(B) Environmental Engineering

ELECTIVE COURSES:

Course Code	Course Title	Credit Hours
CB 720	Water Quality Management and Waste Water Treatment	3
CB 721	Air Pollution and Indoor Air Quality	3
CB 722	Management of Solid, Hazardous and Radioactive Waste	3
CB 723	Environmental Impact Assessment of Civil Engineering Projects	3
CB 724	Ecological Concepts	3
CB 725	Noise Pollution	3
CB 726	Marine Pollution	3
CB 727	Energy and Natural Resources Conservation	3
Subtotal	**8 Courses * 3 Credit Hours**	**24**

RESEARCH THESIS:

Course Code	Course Title	Credit Hours
CB 701	Master's Research Thesis (Part 1)	6
CB 702	Master's Research Thesis (Part 2)	6
Subtotal	**2 Parts * 6 Credit Hours**	**12**

Total	**36**

Courses

Course Code : CB 720

Course Title : Water Quality Management and Waste Water Treatment

Credit Hours : 3

Course Description

Water quality standards, water quality management in rivers and lakes, water pollutants sources, water and waste-water treatment systems, pollution of natural water bodies, ground water pollution, effects of water pollution on health and vegetation, development and implementation of pollution prevention programs.

Course Objectives

The course aims at enabling the student to acquire the advanced techniques of water and wastewater treatment, identify the characteristics of different water pollutants, and assess the effects of water pollution on health and vegetation.

Course Topics

- Water quality standards
- Water quality management in rivers and lakes
- Water pollutants sources
- Water pollutants sources, water and waste-water treatment systems
- Pollution of natural water bodies
- Ground water pollution
- Development and implementation of pollution prevention programs
-

References

- Haigh, "Wate*r and Environmental Management: Design and Construction of Works*", Wiley, 1991.
- Salvato, Joseph A., "*Environmental Engineering and Sanitation*", Prentice Hall, 1992.
- Corbitt, Roberts A., "*Standard Handbook of Environmental Engineering*", McGraw-Hill, 1998.
- Peavy, "*Environmental Engineering*", McGraw-Hill, 1997.

Course Code : CB 721

Course Title : Air Pollution and Indoor Air Quality

Credit Hours : 3

Course Description

Air pollution sources and identification, modeling of air pollution, monitoring and control instruments, green house effect, air-water exchange, emission standards from industrial sources, atmospheric dispersion, effects of air pollution on health and vegetation, automotive exhaust emissions, meteorology, acid rains, sources and control of indoor air pollution.

Course Objectives

The course aims at enabling the student to identify the characteristics of different air pollutants, acquire the methods of air pollution control and modeling, and assess the effects of air pollution on health.

Course Topics

- Air pollution sources and identification
- Effects of air pollution on health and vegetation
- Meteorology principles
- Atmospheric dispersion
- Air-water exchange
- Sources and control of indoor air pollution
- Measurement techniques
- Implementation of air pollution prevention programs

References

- Sink, Michael K., "*Control Technologies for Hazardous Air Pollutants: A Handbook*", DIANE Publishing Company, 1994.
- Schmidt, "*Air Pollution Assessment and Control*", Wiley, 1998.
- Maslansky, Carol J., "*Air Monitoring Instrumentation: A Manual for Emergency, Investigatory, and Remedial Responders*", Prentice Hall, 1993.
- Market Intelligence Staff, "W*orld Indoor Air Quality Monitoring and Building Control System*", Frost and Sullivan Market Intelligence, 1994.

Course Code : CB 722

Course Title : Management of Solid, Hazardous and Radioactive Waste

Credit Hours : 3

Course Description

Sources and characteristics of solid waste and hazardous, collection and transportation systems, solid waste storage and recycling, waste minimization, resource conservation and recovery, treatment technologies, ground water contamination and remediation, management of radiological solid waste, effects of radioactive waste on health and vegetation.

Course Objectives

The course aims at enabling the student to identify the characteristics of different Solid waste and hazardous, acquire the methods of solid waste storage and recycling, and evaluate the effects of radioactive waste on health and vegetation.

Course Topics

- Sources and characteristics of solid waste
- Sources and characteristics of hazardous waste
- Collection methods
- Transportation systems
- Solid waste storage and recycling
- Waste minimization, resource conservation and recovery
- Treatment technologies
- Ground water contamination and remediation
- Management of radiological solid waste

References

- Bigelow, Charles R., "*Hazardous Materials Management in Physical Distribution*", Prentice Hall, 1994.
- Hickman, H. Lanier, "*Exercise Manual to Accompany Principles of Integrated Solid Waste Management*", American Academy of Environmental Engineers, 1999.
- Liu, David H., "*Environmental Engineers Handbook*," C R C Press LLC, 1997.
- Peavy, "*Introduction to Environmental Engineering*", McGraw-Hill, 1991.

Course Code : CB 723

Course Title : Environmental Impact Assessment of Civil Engineering Projects

Credit Hours : 3

Course Description

Origins of Environmental Impact Assessment, EIA procedure, policy options, legislative options, methods of project screening for EIA, preparation and review of an EIA, contribution of Civil Engineer in environmental control, case study.

Course Objectives

The course aims at enabling the student to learn the procedure for conducting an Environmental Impact Assessment (EIA), understand the civil engineer role in environmental control, and evaluate the environmental impact of civil engineering projects.

Course Topics

- Origins of Environmental Impact Assessment
- EIA procedure
- Policy and legislative options
- Methods of project screening for EIA
- Preparation and review of an EIA
- Contribution of Civil Engineer in environmental control
- Case studies

References

- Cheremisinoff, Paul N., "*Ecological Issues and Environmental Impact Assessment*", Gulf Publishing Company, 2004.
- ReVelle, Charles S., "*Civil and Environmental Engineering Systems: An Advanced Applications*", Penguin Books, 2003.
- Bowman, Valcar A., "*Effective Environmental Management Systems (EMS)*", Cahners Business Information, 2002.
- Soares, Claire, "*Environmental Engineering and Management: ISO 14000 Standards, Regulating Compliance: A Practical Approach*" Penguin Books, 2002.
- Liu, David H., "*Environmental Engineers Handbook*", CRC Press LLC, 1997.

Course Code : **CB 724**

Course Title : **Ecological Concepts**

Credit Hours : **3**

Course Description

Ecological perspective, the value of the environment, atmosphere constitution, solar radiation, flow of energy in ecosystem, climatic diagram of globe, microclimate, water cycle, rainfall, geological cycle, soil classification, ecological classification, ecosystems constitution, biosphere, population biology, substances cycle.

Course Objectives

The course aims at enabling the student to learn the ecological basics of changing environments, acquire the water and substances cycle, and evaluate the effects of stresses in ecosystems.

Course Topics

- Ecological perspective
- The value of the environment
- Atmosphere constitution
- Flow of energy in ecosystem, and climatic diagram of globe
- Water cycle, rainfall, and geological cycle
- Soil classification
- Ecological classification
- Substances cycle

References

- Molles, Manuel C., "*Ecology: Concepts and Applications*", McGraw-Hill Co, 1998.
- Pianka, Eric R, "*Evolutionary Ecology*", Addison-Wesley Educational Publishers, 1999.
- Shugart, Herman H., "*Terrestrial Ecosystems in Changing Environments*", 03/1998.
- Cech, Joseph J., "*Multiple Stresses in Ecosystems*", C R C Press LLC, 1998.

Course Code : CB 725

Course Title : Noise Pollution

Credit Hours : 3

Course Description

Physical properties of sound, effects of noise on people, noise sources and criteria, noise standards, noise measurement, outdoor propagation of sound, noise section of an Environmental Impact Assessment, traffic noise prediction, noise pollution control and prevention, noise regulation.

Course Objectives

The course aims at enabling the student to learn the physical properties of sound, identify the noise sources and the means of noise reduction, and evaluate the effects of noise on human beings.

Course Topics

- Physical properties of sound
- Effects of noise on people
- Noise sources, criteria, and noise standards
- Outdoor propagation of sound
- Noise section of an Environmental Impact Assessment
- Traffic noise prediction
- Noise pollution control and prevention
- Noise regulation

References

- Cowan, James P., "*Handbook of Environmental Acoustics*", Van Nostrand Reinhold Inc, 1994.
- Solomon, Norman, "*Environmental Analysis, Air Quality, Noise, Energy, and Alternative Fuels*", National Research Council, 1994.
- Liu, David H., "*Environmental Engineers Handbook*", C R C Press LLC, 1997.
- Soares, Claire, "*Environmental Engineering and Management: ISO 14000 Standards, Regulating Compliance: A Practical Approach*", Penguin Books, 1997.

Course Code : CB 726

Course Title : Marine Pollution

Credit Hours : 3

Course Description

Sources of marine pollution, marine ecology, oil and seashore pollution, monitoring and control instruments, modeling of marine pollution, ecological effects, prevention and regulation in marine sector, effect of marine pollution on birds and aquatic beings, marine pollution costs, case studies.

Course Objectives

The course aims at enabling the student to identify the sources of marine pollutants, learn new techniques of monitoring and control instruments, and evaluate the effects of marine pollution on health and economy.

Course Topics

- Sources of marine pollution
- Effect of marine pollution on birds and aquatic beings
- Monitoring and control instruments
- Modeling of marine pollution
- Prevention and regulation in marine sector
- Effect of marine pollution on birds and aquatic beings
- Marine pollution costs, case studies
- Implementation of marine pollution prevention Programs

References

- Walker, C. H., "*Persistent Pollutants in Marine Ecosystems*", Pergamon Chess, 1992.
- Good, James W., "Co*astal Natural Hazards: Science, Engineering, and Public Policy*", Oregon Sea Grant, 1993.
- Earle, Sylvia A., "*Sea Change: The Message of the Oceans*", Fawcett Book Group, 1998.
- April P., "*Seashore"*, Twenty-First Century Books, 1995.

Course Code : CB 727

Course Title : Energy and Natural Resources Conservation

Credit Hours : 3

Course Description

Methods of energy conservation in buildings, natural resources conservation, environmental architecture, selection of green materials, resource recovery, recycling, life cycle strategy, elements of waste minimization strategy, benefits of waste minimization, waste reduction techniques, case study

Course Objectives

The course aims at enabling the student to acquire the methods of energy conservation and selection of green materials, understand the vitality of natural resources conservation, and learn new techniques of energy recovery.

Course Topics

- Renewable and non-renewable energy
- Air pollution from energy consumption
- Energy and thermal comfort
- Thermal dynamics of buildings
- Techniques of energy conservation in buildings
- Passive heating and cooling systems
- Energy recovery from landfills and WWTP
- Implementation of energy conservation programs

References

- Hart, "*Energy and the Environment: Physics Principles and Applications*", Kendall/Hunt Publishing Company, 1998.
- Owen, Oliver S., "*Natural Resources Conservation: Management for a Sustainable Future*", Wiley, 1997.
- ReVelle, Charles S., "*Civil and Environmental Engineering Systems: An Advanced Applications*", Penguin Books, 1997.
- Krigger, John T., "*Residential Energy: Cost Savings and Comfort for Existing Buildings*", Saturn Resource Management, 1996.

Faculty Members

(in alphabetical order)

- **AHMED AWAD**
  Ph.D. (2006) Nottingham University, UK
  Construction Management

- **AHMED RAGHEB**
  Ph.D. (1994) Rensselaer Polytechnic Institute, USA
  Geotechnical Engineering

- **AKRAM SOLIMAN**
  Ph.D. (2003) Nottingham University, UK
  Coastal Engineering and Hydraulics

- **ALY I. ELDARWISH,** Head of Department
  Ph.D. (1994) Michigan State University, USA
  Construction Materials and Reinforced Concrete Structures

- **EHAB EL-KASSAS**
  Ph.D. (2001) Dundee University, UK.
  Structural Engineering

- **HESHAM BASSIONI**
  Ph.D. (2004) Loughborough University, UK
  Construction Management

- **KARIM M. HELMY**
  Ph.D. (2007) University of Manitoba, Canada
  Structural Engineering

- **KHALED SHAWKI**
  Ph.D. (2002) Alexandria University, Egypt
  Construction Engineering

- **MOHAMED FODA**
  Ph.D. (1988) McGill University, Canada
  Transportation and Highway Engineering

- **MOHAMED IHAB EL-MASRY**
  Ph.D. (2004) University of Southern California, USA
  Structural Engineering

- **MOHAMED RASLAN**
  Ph.D. (1987) Southampton University, UK
  Structural Engineering and Metallic Structures

- **MORSY Alaa**
  Ph.D. (2009) Alexandria University, Egypt
  Structural Engineering

- **NABIL EL-ASHKAR**
  Ph.D. (2002) Georgia Institute of Technology, USA
  Construction Materials

- **NABIL ISMAIL**
  Ph.D. (1981) University of California, Berkeley, USA
  Coastal Engineering and Water Resources

- **TAREK M. ABDEL-AZIZ**
  Ph.D. (2007) Alexandria University, Egypt
  Geotechnical Engineering

- **USAMA ELSHAMY**
  Ph.D. (2005) Rensselaer Polytechnic Institute, USA
  Geotechnical Engineering.

- **WAEL KAMEL**
  Ph.D. (1994) University of Paul Sabatier, France
  Environmental Engineering

General Rule for Graduation

For Graduation [M.Sc. in Construction & Building Engineering]

A student should complete (with satisfactory grades) a total of 8 courses (24 Credit Hours) and a thesis (12 Credit Hours) with a total of (36 Credit Hours).

A student can take into account a maximum of 7 courses (21 Credit Hours) from the same special division for the completion of the requirements of his graduation.

For Graduation [M.Sc. in Construction & Building Engineering (special division)]

A student should complete at least 5 courses (15 Credit Hours) at the special division and a thesis (12 Credit Hours) at the same special division.

Note:

- Each student must have a supervisor by the end of the first term.
- An advising committee, assigned by the department council, will be acting as the academic advisor for the student until he chooses a supervisor.
- The student after consulting with his supervisor chooses the courses.