

College of Environmental Design

Masters of Engineering Management Program

Overview

The global economy and rapid changes in technology require an increasing number of engineers with technical expertise and modern management skills. Today's engineers are routinely confronted with broader job responsibilities, often involving organizational and managerial aspects that must be integrated with the technical aspects. There is a high demand by engineering professionals in the industry for engineering management programs; as such qualifications are valuable for their career advancement.

The competitive nature of industry in the Gulf region requires engineers with technical and managerial skills. Identifying, evaluating, implementing and managing the most appropriate information sources, technologies and systems demand a well-developed level of scientific management, team-building and economic skills. The subject matters in the Engineering Management program enhance the management and technical skills of all engineers, regardless of their discipline; to meet today's demands as well as those of the future.

The program emphasizes academic and research excellence along with professional development of student in particular area of interest. The program offers wide selection of courses and research activities related to Engineering and Management which satisfies the local as well as the global needs of the industry.

The main features of the Engineering Management Program

- Interdisciplinary nature of the program offering students selection of elective courses from the Construction Engineering & Management department, Systems Engineering department, College of Industrial Management as well as selected courses from other departments.
- Its quality is comparable with similar international Programs while introducing flexibility to meet local needs without affecting the quality of the Program.
- The program is well positioned to address the areas of recent research in the area.

Program Objectives

- Provide engineers with career advancement opportunities as managers in the areas of engineering, design, research and development projects.

- Assist professional engineering managers to help reassert competitiveness in the global marketplace.
- Teach the skills and mechanisms necessary to deal with changes associated with managing new and breakthrough technologies.
- Train engineers to plan, design, manage, and control complex technological projects.

Program Requirements

Students are required to complete 42 credit hours for graduating with a Master of Engineering Degree. This includes 24 hours of core courses, 9 hours of designated electives from graduate courses of System Engineering, Industrial Management or Construction Engineering & Management, 6 credit hours of free electives from approved graduate courses and 3 credit hours of Master of Engineering Report and a Research Seminar.

Admission requirements for the Program

Admission to the program requires fulfilling all KFUPM and Deanship of Graduate Studies requirements. In addition, the applicant should meet the following program requirements:

Bachelor's Degree in an Engineering discipline equivalent to KFUPM Bachelor's with cumulative GPA per College of Graduate Studies requirements.

Master of Engineering Management Program Requirements

Course	Course Title	Credit
MGT 501	Principles of Management	3
OM 502	Statistical Analysis for Business ¹	3
EM 510	Engineering Economy	3
EM 520	Quantitative Methods in EM	3
MGT 511	Organizational Theory and Design	3
CEM 515	Project Quality Management	3
EM 530	Decision Analysis	3
EM 550	Project Management	3
EM 599	Research Seminar	0
XXX 5xx	Designated Electives I	3
XXX 5xx	Designated Electives II	3
XXX 5xx	Designated Electives III	3
XXX 5xx	Free Electives I	3
XXX 5xx	Free Electives II	3
EM 600	M.E Report	3
Total Credit Hours		42

(1) Student can take CRP 505 Urban Statistics in lieu of OM 502

Elective Courses

Designated Electives: 9 credit hours of elective courses should be selected from Systems Engineering, College of Industrial Management or Construction Engineering & Management courses.

Free Electives : 6 credit hours of free electives from graduate courses with the approval of the department.

Systems Engineering Department Courses:

- SE 511 Computer Aided Design
- SE 513 Modeling and System Identification I
- SE 523 Forecasting Systems
- SE 531 Systems Reliability/Maintainability
- SE 536 Human Factors Engineering
- SE 539 Systems Safety Engineering
- SE 548 Sequencing and Scheduling
- SE 567 Work Physiology
- SE 569 Human Factors in Computing Systems
- SE 570 Optimization Methods for Engineering Designs
- Other approved System engineering Courses

Construction Engineering and Management Courses:

- CEM 510 Project Planning and Scheduling
- CEM 511 Cost Estimating
- CEM 512 Value Engineering
- CEM 513 Construction Productivity
- CEM 517 Project Safety Management
- CEM 518 Project Cost Management
- CEM 520 Construction Contracting and Administration
- CEM 522 Globalization and Construction Industry
- CEM 525 Project Delivery Systems
- CEM 527 Construction Claims and Dispute Resolution
- CEM 542 Tech. Innovation in Construction & Project Management.
- CEM 549 Construction Management Information
- Other approved CEM Courses

Courses from College of Industrial Management – CIM

- ACCT 501 Financial Accounting
- FIN 501 Corporate Finance
- ECON 501 Principles of Economics
- MIS 502 Management Information Systems
- ACCT 510 Managerial Accounting
- ECON 510 Managerial Economics
- OM 512 Production and Operations Management
- MKT 512 Applied Marketing Research
- FIN 510 Management Finance
- MIS 510 Information Resources Management
- MGT 524 International Comparative Management
- MGT 525 Human Resources Management
- MGT 526 Management of Organizational Change and Development
- MGT 527 Entrepreneurship and Small Business Management
- MGT 528 Strategic Management
- MGT 513 Managerial Communication
- MGT 521 International Business
- MGT 522 Organizational Behavior and Leadership
- MGT 523 Leadership Motivation and Power
- Other approved College of Industrial management Courses

Suggested Free Electives

- ICS 585 Knowledge-Based Systems
- CRP 533 Public Works Management
- CRP 535 Urban Infrastructure Planning
- ARE 520 Principles of Facilities Management
- ARE 528 Real Estate Management
- PETE 550 Petroleum Economics
- PETE 551 Petroleum Economic Analysis

Courses Description

MGT 501 Principles of Management (3-0-3)

Fundamentals of managing work and organization, managing people and managing production operations. Topics include basic management functions of planning, organizing, leading, and controlling and related organizational processes of communication, decision-making and socialization. Other related issues such as globalization, social responsibility, ethics and application to the Saudi business environment are also covered.

Prerequisite: Graduate Standing

OM 502 Statistical Analysis for Business (3-0-3)

The course will employ the application of basic statistical techniques for Management Basic concepts of probability and probability distributions, estimation theory and test of hypothesis, regression analysis, and analysis of variance. This Course is Equivalent to CRP 505

Prerequisite: Graduate Standing

EM 510 Engineering Economy (3-0-3)

Covers the theory and application of advanced engineering economy principles and methods. Studies the effects of inflation, depreciation and taxes, cost estimation, sensitivity analysis, risk and uncertainty, capital budgeting, multi-attribute decision making, advanced asset replacement analysis and real option analysis. Includes case studies and a term project related to the topic.

Prerequisite: Graduate Standing

EM 520 Quantitative Methods in Engineering Management (3-0-3)

Linear Programming: Concepts and Solution Techniques, Transportation and Assignment Models, Inventory Management Models, Queuing Theory, & Monte Carlo Simulation, Computer Applications. This course is equivalent to ARE 511 & CEM 514

Prerequisite: Graduate Standing

MGT 511 Organization Theory and Design (3-0-3)

Analysis of organizations as open systems, with emphasis on maximizing congruency among organizational structure, strategies, and environments; and the understanding of the impact of alternative design configurations and strategies on the individual, group, and inter-group behavior and performance. A primary focus is the influences on organizational performance and effectiveness.

Prerequisite: MGT 501 or waiver of this prerequisite according to the waiver guidelines.

CEM 515 Quality Management (3-0-3)

Introduction to quality management principles including its history, the role of total quality, and the philosophical perspectives supporting total quality. In-depth look at the management system and its relationship to total quality. Investigation of technical issues and the role of tools and techniques in the quality management process including methods, quality improvement and associated management models, and reliability in design and production. Exploration of methods of building and sustaining quality organizations.

Prerequisite: Graduate Standing

EM 530 Decision Analysis (3-0-3)

Covers the theory and practice of decision analysis and risk assessment. Covers decision theory, game theory, utility and risk attitude, probability assessment, multi-criterion decision making models. Describes practical applications through real-world engineering /project management decision analysis applications. Computer applications.

Prerequisite: OM 502 , CRP 505 or Equivalent

EM 550 Engineering Project Management (3-0-3)

Covers the elements of project management critical to the success of engineering projects: project management framework, strategic management and project selection, project organization, human aspects of project management, conflicts and negotiations, scope management, time management, cost management, risk management, contracts and procurement, project termination, the project management office, and modern developments in project management. Integrates and clarifies the principles and tools through case studies from a variety of disciplines.

Prerequisite: Advanced EM Standing

EM 599 Research Seminar (1-0-0)

This course is designed to give the student an overview of research in the engineering management specialty and in the department, familiarity with the research methodology, journals and professional societies in the discipline. Graded on a Pass or Fail basis.

Prerequisite: Graduate Standing

EM 600 M.E. Report (0-0-3)

Research study that deals with a analysis and/or design of significant problem or case study related to the field of Engineering Management prepared under the supervision of an Engineering Management faculty. The project report should follow formal report format including introduction, literature review, research methodology, collection and analysis of data, conclusions and recommendations, list of references and appendices of important information.

Prerequisite: EM 599

DEGREE PLAN FOR FULL – TIME STUDENTS (M.E. in Engineering Management)

Course Code **Course Title** **LT** **LB** **CR**

First Semester

MGT 501	Principles of Management	3	0	3
EM 520	Quantitative Methods in EM	3	0	3
xxx 5xx	Designated Elective – I	3	0	3

Semester Total **9** **0** **9**

Second Semester

EM 510	Engineering Economy	3	0	3
OM 502	Statistical Analysis for Business	3	0	3
xxx 5xx	Designated Elective – II	3	0	3

Semester Total **9** **0** **9**

Third Semester

MGT 511	Organizational Theory and Design	3	0	3
CEM 515	Quality Management	3	0	3
xxx 5xx	Designated Elective – III	3	0	3

Semester Total **9** **0** **9**

Fourth Semester

EM530	Decision analysis	3	0	3
EM 550	Engineering Project Management	3	0	3
xxx 5xx	Free Elective 1	3	0	3
EM 599	Research Seminar	1	0	0

Semester Total **10** **0** **9**

Fifth Semester

xxx 5xx	Free Elective - II	3	0	3
EM 600	M.E. REPORT	3	0	3

Semester Total **6** **0** **6**

Total Credit Hours: **42**

DEGREE PLAN FOR PART – TIME STUDENTS (M.E. in Engineering Management)

Course Code **Course Title** **LT** **LB** **CR**

First Semester

MGT 501	Principles of Management	3	0	3
EM 520	Quantitative Methods in EM	3	0	3

Semester Total **6** **0** **6**

Second Semester

EM 510	Engineering Economy	3	0	3
OM 502	Statistical Analysis for Business	3	0	3

Semester Total **6** **0** **6**

Third Semester

MGT 511	Organizational Theory and Design	3	0	3
CEM 515	Quality Management	3	0	3

Semester Total **6** **0** **6**

Fourth Semester

EM 530	Decision Analysis	3	0	3
xxx 5xx	Designated Elective – I	3	0	3

Semester Total **6** **0** **6**

Fifth Semester

xxx 5xx	Designated Elective – II	3	0	3
xxx 5xx	Designated Elective – III	3	0	3

Semester Total **6** **0** **6**

Sixth Semester

EM 550	Engineering Project Management	3	0	3
xxx 5xx	Free Elective – I	3	0	3
EM 599	Research Seminar	1	0	0

Semester Total **7** **0** **6**

Seventh Semester

xxx 5xx	Free Elective – II	3	0	3
EM 600	M.E. REPORT	3	0	3

Semester Total **6** **0** **6**

Total Credit Hours: **42**

ADDITIONAL INFORMATION

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