

ENGINEERING MANAGEMENT

The William States Lee College of Engineering

274 Smith

(704) 547-2614

<http://www.coe.uncc.edu>

Degree

M.S.

Coordinator

J. William Shelnett

Graduate Faculty

Kent E. Curran, Assistant Professor, Civil Engineering

Jack B. Evett, Professor, Civil Engineering

Johnny R. Graham, Associate Professor, Civil
Engineering

L. Ellis King, Professor, Civil Engineering

Jy Shing Wu, Professor, Civil Engineering

David T. Young, Associate Professor, Civil Engineering

Keh-Hsun Chen, Associate Professor, Computer Science

Bei-Tseng Chu, Associate Professor, Computer Science

Mirsad Hadzikadic, Associate Professor, Computer
Science

Junsheng Long, Associate Professor, Computer Science

Zbigniew Michalewicz, Professor, Computer Science

Zbigniew Ras, Professor, Computer Science

Kalpathi R. Subramanian, Assistant Professor,
Computer Science

William J. Tolone, Assistant Professor, Computer Science

A. Barry Wilkinson, Professor, Computer Science

Jing Xiao, Associate Professor, Computer Science

Edwin Braun, Associate Professor, Engineering
Technology

Douglas Ramers, Assistant Professor, Engineering
Technology

J. William Shelnett, Professor, Engineering Technology

Haldun, Aytug, Professor, Information and Operations
Management

Douglas Cooper, Professor, Information and Operations
Management

Moutaz Khouja, Associate Professor, Information and
Operations Management

Ram L. Kumar, Associate Professor, Information and
Operations Management

Cem Saydam, Professor, Information and Operations
Management

Anthony C. Stylianou, Associate Professor, Information
and Operations Management

Ella Bell, Associate Professor, Management

Craig Pearce, Assistant Professor, Management

Kent N. Gourdin, Associate Professor, Marketing

Monica Perry, Assistant Professor, Marketing

Program of Study

The Engineering Management Master of Science Degree program prepares professionals for careers in managing projects, programs, and organizations. Industrial, research, consulting, and commercial firms now demand engineering managers with both cutting-edge technical competence and the management skills necessary to forge linkages with the business sides of these organizations. These managers must be able to form and manage high performance teams and manage technological operations. The program of study is necessarily multidisciplinary, combining elements of advanced study in various engineering disciplines with studies of business operations and organizational behavior.

Additional Admission Requirements

- 1) Either a bachelor's degree in engineering or a closely related technical or scientific field, or a bachelors degree in business, provided relevant technical course requirements have been met. It is expected that some students in the second category will have a major in business and a minor in engineering.
- 2) Undergraduate coursework in engineering economics (or equivalent).
- 3) Integral and differential calculus (MATH 1120 and 1121 at UNC Charlotte).
- 4) Statistics (STAT 1220 at UNC Charlotte).
- 5) An average grade of 3.0 (out of 4) on items 2,3, and 4 above.

Documents to be submitted for admission

- 1) Transcript(s) showing a baccalaureate degree in engineering, engineering technology, or a scientific discipline, or a baccalaureate degree in business administration from an accredited college or university.
- 2) A satisfactory score on the aptitude portion of the Graduate Record Examination (depending on the student's background, the Graduate Management Admission Test, GMAT, may be substituted in certain cases).
- 3) Written descriptions of any relevant and significant work experience.
- 4) If the applicant's native language is not English, an overall score of 575 (old system) or 230 (new computer-based examination) in the Test of English as a Foreign Language (TOEFL), with scores of at least 55 (20 on the new examination) on the individual sections: listening comprehension; structure and written expression; vocabulary and reading comprehension.

Degree Requirements

Thirty semester hours of approved graduate work within one of two options:

Option 1: Successful completion of 30 semester hours of graduate-level coursework.

Option 2: Successful completion of 24 semester hours of graduate-level coursework and six hours of thesis research.

The curriculum consists of six core courses and four additional courses (or two courses with the thesis option) selected from an approved list of electives. Students are expected to complete a Plan of Study that identifies a concentration such as Manufacturing Management or Environmental Management.

Required Core Courses:

- EMGT 6901 Advanced Project Management (3)
- EMGT 6142 Quality and Manufacturing Management (3)
- MBAD 6161 Organizational Leadership and Behavior I (3)
- MBAD 6164 Executive Communication (3)
- MBAD 6195 Strategic Management of Technology (3)
- MBAD 6141 Operations Management (3)

Note: Students will be required to have adequate preparation prior to taking the required MBAD (Master in Business Administration) courses. Normally this will consist of at least completion of courses in engineering economics, foundations of economics, and mathematics through differential and integral calculus. Students will be **EMGT 6901. Advanced Project Management. (3)** Prerequisite: Consent of Instructor. Study of various aspects of project management including project types and organizations, regulatory and liability issues, planning, budget, risk assessment, and conflict resolution. Exercises involve research into emerging management processes, use of computerized techniques, and application of management theories in team-based projects. (*Alternate years*)

EMGT 6902. Legal Issues in Engineering Management. (3) Survey of legal issues surrounding engineering products and services, including warranty, liability, contracting, intellectual property, codes, and accepted practice. Legal principles, precedents, case studies, and research projects. (*On demand*)

EMGT 6904. Product and Process Design. (3) Application of principles of creative problem solving to design of products and processes by multi-disciplinary teams. Taking as the definition of design "the communication of a set of rational decisions for accomplishing stated objectives within prescribed constraints," the teams produce elements of designs for

advantaged by having completed courses in foundations of accounting and statistics.

Elective Courses (Partial Listing – contact graduate coordinator for updated listing):

- MBAD 6122 Technology Enhanced Decision Making (3)
- EMGT 6902 Legal Issues in Engineering Management (3)
- EMGT 6904 Product and Process Design (3)
- CEGR 5142 Water/Wastewater Engineering (3)
- CEGR 5234 Hazardous Waste Management (3)
- CEGR 5235 Industrial Pollution Control (3)
- CEGR 6142 Bioenvironmental Engineering (3)
- CEGR 6144 Environmental Biotechnology (3)

Other graduate courses may be taken as elective courses for the engineering management degree with approval of the program coordinator.

COURSES IN ENGINEERING MANAGEMENT

EMGT 6142. Quality and Manufacturing Management. (3) Provides an in-depth study of current issues and advances in manufacturing management. Topics include just-in-time inventory management, total quality management, statistical process control, continuous improvement, flexible manufacturing systems, computer-integrated manufacturing, technology evaluation and selection, and manufacturing strategy. Emphasis on use of computers for decision support. Various products and services at points in the sequential stages of design. Teams make periodic reports and presentations to the class on design assignments. (*On demand*).

EMGT 6905. Designed Experimentation. (3) Prerequisites: Statistics and consent of instructor. Design of quality into products and processes using statistically designed experimentation (DOE), a systematic and efficient method of design optimization for enhanced performance, quality, and cost. Emphasis on designing and conducting useful experiments rather than the basis in statistical theory. Includes robust parameter design and tolerance design techniques. Review and comparison of Taguchi methods with conventional designed experimentation. Extensive use of specialized computer software to design experiments and analyze results in team projects; screening experiments, and sequential response surface methods.