

**California State Polytechnic University, Pomona, College of Engineering
Industrial and Manufacturing Engineering Department**

Master of Science in Engineering Management

Unique Characteristics of the Program

The Master of Science in Engineering Management (**MSEM**) degree is a unique program developed to meet industry need for highly qualified and well trained engineering managers. Surveys of local industry and alumni indicate the interest and need for a program that gives engineers advanced multidisciplinary training in manufacturing, production and operations management, business, and finance. The MSEM is such an interdisciplinary program to be offered by the College of Engineering in cooperation with the College of Business Administration.

Most of the applicants to the MSEM program are expected to have work experience, to be working full-time, and to enroll as part-time students. On balance, this program is expected to increase graduate enrollment by attracting a large group of new applicants practicing engineers that are not interested in pursuing traditional masters degrees in engineering or business administration. It culminates in an engineering management research experience that addresses students and industry needs. Students will be given the option of performing thesis research on individual topics or to join research teams sponsored by one of the programs' industry partners.

Admission to the Program

All applicants for the Masters in Engineering Management must file an admission application on line at www.csummentor.edu. To receive **unconditional admission** to the MSEM program applicants must hold a baccalaureate degree in engineering, or engineering technology,¹ from an ABET-accredited program. In addition, the applicant must have attained a grade point average of at least **3.0** in all undergraduate upper division mathematics, science and engineering courses and, likewise in all courses attempted with graduate standing. **Conditional admission** may be granted in cases in which the applicant does not satisfy the criteria for unconditional admission, but can demonstrate aptitude for graduate study by submitting test scores of the Graduate Record Examination, letters of recommendation and other relevant documents. Test score required for the Graduate Record Exam (GRE) is a minimum of 1100 in the Quantitative and Verbal sections of the exam and must be submitted prior to admission.

All applicants from foreign countries should contact the Office of Admissions at least one year in advance of application so that all required materials may be supplied in time for evaluation. Applicants whose native language is not English must submit the results of the Test of English as a Foreign Language (**TOEFL**) prior to admission.

1. Applicants holding engineering technology degrees may be required to take the GRE Test and/or some preparatory courses with no graduate credit.

The Program

A minimum of 48 quarter units² of course work is needed. This should include at least 24 units of graduate engineering (EGR) courses and a minimum of 24 quarter units of graduate business administration (GBA) courses. A maximum of 8 quarter units at the 400 level may be accepted as alternative to graduate EGR or GBA courses. A grade point average of 3.0 or better must be maintained. Each student will select an advisors from the College of Engineering. The student will develop, with his or her advisors, a program of study that satisfies the degree requirements. A total of 13 quarter units of transfer, Extended University or units petitioned for graduate study, or any combination of 13 units may be included in a Master's contract. The stipulated time limit of 7 years applies to all of the above.

After entering the program, graduate students are permitted to complete an initial twelve units before selecting an advisor. To continue in the program an advisor must be selected and a program of study agreed upon. Students are advised that the selection of two additional committee members, one from the College of Engineering and one from the College of Business Administration is also advisable at this time. Committee members are needed for Master's thesis or independent study, and early selection is advantageous. The program of study must be developed with the student's advisor and submitted for approval to the Industrial and Manufacturing Engineering Department and the Engineering Graduate Studies Office, before the end of the third quarter of attendance or upon completion of 16 units; whichever comes first.

Students are strongly advised that a master's program is not simply a continuation of undergraduate work. It is as different as college work is to high school work, and the student should be prepared for the rigorous study involved as well as completing the research for thesis or independent study. A grade point average of 3.0 must be maintained to continue in the program.

Inasmuch as most students in the master's program work full time and take classes in the evening it should be noted that at the rate of one or two courses per quarter as well as the thesis or independent study, the program may take an extended time to complete. Students and their employers should be aware of the commitment required by the program.

Admission to the program does not admit a student to candidacy for a degree. Advancement to candidacy is granted upon the recommendation of the graduate faculty. Students who are not candidates are not eligible to register for EGR 691, 692 and 696. In order to advance to candidacy the student must:

1. Satisfy all admissions conditions, if any.
2. Have an approved program of study
3. Complete at least 32 units of graduate coursework with a grade point average of 3.0 or better; and
4. Satisfy the Graduation Writing Test.

2. The student may be required to take additional courses to satisfy all prerequisites for the MSEM courses included in his or her program of study

Course Requirement: A minimum of 48 quarter units is required for the Master of Science in Engineering Management (MSEM) program. This should include at least 24 quarter units of graduate engineering (EGR) courses and a minimum of 24 units of graduate business administration (GBA) courses. For the description of the courses listed below, please also refer to the University Catalog.

Breadth (20 Units)		
EGR 538 Adv. Engineering Economics or EGR 539 Adv. Human Factors in Engr. Design	4	
EGR 549 Adv. Methods in O.R.	4	
EGR 572 Total Quality Mgt. in Engr	4	
EGR 573 Adv. Operations. Plng. & Cont. Sys.	4	
EGR 574 Adv. Facility Planning	4	
Emphasis (20)		
GBA 511 Financial/Managerial Accounting	4	
GBA 514 Managerial Statistics	4	
GBA 546 Fundamentals of Financial Management	4	
GBA 636/637 Project Management	3/1	
GBA 687/688 Mgt. Policies & Strategies	3/1	
Electives (4-6 Units Minimum)		
EGR 596 Research Methods	2	
EGR 691 Directed Study	2	
GBA 517 Essentials of Marketing Mgt.	4	
GBA 530 Legal Environment of Bus.	4	
GBA 552 Analysis of Federal Contracts	4	
GBA 562 Personnel Management	4	
GBA 615/616 Seminar in Org. Behavior	3/1	
Terminal Options		
EGR 692 Master Degree Project	2	
EGR 696 Master's Thesis	4-8	
Program Total (Min. 48)		

Courses and Prerequisites

Courses in Engineering:

EGR 538 Advanced Engineering Economy (4)

Engineering economic decision criteria and models for evaluating capital investment proposals and engineering projects. Replacement studies, risk and uncertainty, tax effects, intangibles, probabilistic models, computer techniques.

Prerequisite: 3 quarter units of undergraduate engineering economy.

EGR 539 Advanced Human Factors in Engineering Design (4)

Methods and research techniques in engineering design of optimum man-machine systems. Designing systems with the objective of developing optimum combinations of physical and human components. Effects of environment on human performance. Man-machine dynamics.

Prerequisite: Upper division course in human engineering principles.

EGR 549 Advanced Methods in Operations Research (4)

Methodology of operations research and algorithms for system and subsystem optimization; emphasis on methods yielding practical numerical procedures. Linear programming and extension, dynamic and integer programming, queuing theory, network analysis, game theory and decision theory.

Prerequisite: Upper division course in operations research.

EGR 572 Total Quality Management in Engineering (4)

Introduction to the principles and practices of Total Quality Management. (TQM) The course will also cover the tools and techniques for understanding and implementing TQM. A practical state-of-the-art approach will be used. Applications in service, manufacturing, government, military, construction, education, small business, health care and non-profit organizations will be presented.

Prerequisite: Consent of instructor

EGR 573 Advanced Operations Planning and Control Systems (4)

Operations analysis of integrated production systems; mathematical and computer models for planning, scheduling, and control of production and service systems. Statistical techniques for forecasting, optimization of resources, utilization.

Prerequisite: Upper division course in operations research.

EGR 574 Advanced Facilities Planning (4)

Planning, analyzing, justifying, controlling and evaluating physical facilities. Long and short range facilities plans, decision criteria, authorization and control procedures, post-completion audits. Resource allocation, optimization, simulation and computer techniques. Technical, economic, ecological, safety and intangible factors.

Prerequisite: Undergraduate course in engineering economy.

EGR 596 Research Methods (2)

Introduction to research methods with emphasis on preparing an engineering thesis problem statement. This course prepares engineering graduate candidates for writing theses and independent research papers. Writing problem statements, research questions, experimental and non-experimental design, sampling, instrument design.

Prerequisite: Completion of all required breadth courses on contract.

EGR 691 Directed Study (2)

Case study or investigation of selected engineering problems under the direction of a graduate faculty member. May be repeated as necessary for a maximum of 6 units. Students must register through the Graduate Studies Office. The study should be in the student's emphasis area and should conclude with a written report. May be combined with EGR 692

Unconditional standing required.

EGR 692 Master Degree Project (2)

Study, research or readings (not leading to a thesis) proposed by the student with consultation and approval, and under the supervision of a graduate faculty member. The student must pre-register through the Graduate Studies Office during the quarter prior to taking the course. The study should be in the student's emphasis area, and should conclude with a report and an exam conducted by a committee of faculty members.

Advancement to Candidacy required.

EGR 696 Special Topics for Graduate Students (4)

Independent investigation intended to be an extension of an existing body of knowledge into an area not thoroughly investigated before, directed by a committee of graduate faculty members, and resulting in a published thesis. Must be repeated as appropriate. Students must register through the Engineering Graduate Studies Office. Credit assigned upon successful completion of the entire thesis and approval of the committee.

Advancement to Candidacy required.

Courses in the Graduate School of Business Administration**GBA 511 Financial/Managerial Accounting (4)**

Accounting principles used in the collection, interpretation, and use of financial data from the stand point of creditors, creditors, investors, and management. Study of cost concepts, production cost analysis, and cost-volume-profit analysis.

Prerequisite: GBA 510 or equivalent.

GBA 514 Managerial Statistics (4)

Decision making using classical techniques, non-parametric tests, Bayesian analysis, utility theory, index numbers, and time-series analysis. Sampling and sampling distributions, estimation, hypothesis testing, variance analysis, regression, correlation, and multiple regression.

Prerequisite: STA 120, equivalent or consent of instructor

GBA 517 Essentials of Marketing Management (4)

Developing of marketing strategy to identify and serve the needs of an organization's markets and publics. Concepts relating to the analysis, planning, implementation and control of marketing strategy involving product, promotion, pricing and distribution decisions made within an external environmental context.

GBA 530 Legal Environment of Business (4)

Analysis of the essential legal aspects of the business environment dealing with contracts, business-related torts, agency, employment law and corporations. Function and operation of the courts and administrative agencies. Risk analysis and preventative law approach.

GBA 546 Fundamentals of Financial Management (4)

Theoretical and conceptual framework for financial decision- making stressing analytical and quantitative techniques. Analysis of controversial and sophisticated methods of allocating resources and raising funds both internally and externally within the corporate context.

Prerequisites: GBA 510. GBA 514 and EC 521 and computer proficiency.

GBA 552 Analysis of Federal Contracts (4)

A study problems related to federal contracts' categories either price contract or cost contract. Examines policies/procedures of Federal Acquisition Regulations (FAR), price/cost regulations, includes DOD/DFAS (variations of FAR) applications, influence and advances. Price/cost policy/theory.

GBA 562 Personnel Management (4)

Analytical and descriptive overview of the main sub-fields within personnel (human resources) management. Typical personnel problems of diverse organizations and their solutions using contemporary techniques in accordance with legal requirements.

Prerequisite: GBA 535

GBA 615/616 Seminar in Organizational Behavior (3/1)

Human processes employed in accomplishing work tasks and creating employee satisfaction within the organization. Group experiences whereby students test their interpersonal skills in the organizational environment. Group activities. Concurrent enrollment.

Prerequisite: Completion of all MBA prerequisite courses and microcomputer proficiency.

Unconditional standing required.

GBA 636/637 Project Management (3/1)

Planning, scheduling, resource allocation, coordination and control of the activities using bar charts, networks, critical path analysis, resource leveling and cost-expediting. Computer usage and comparison of microcomputer software for project management.

Concurrent enrollment required.

Prerequisites: Microcomputer proficiency, GBA 531, unconditional standing.

GBA 687/688 Management Policies and Strategies Practicum (3/1)

A capstone course on decision making at the strategic management level. Cases and assigned readings utilized to focus on the various functional areas of business. Topics include consideration of business ethics and international issues. Concurrent enrollment required.

Prerequisites: Completion of MBA core courses or consent of instructor; microcomputer proficiency; unconditional standing

Frequently Asked Questions

1. How do I get an Academic Advisor? You are permitted to enroll in the first 12 units of the program without an Advisor. Take that opportunity to consider the instructor in each EGR course as a possible Advisor, also consider any other member of the faculty whom you may know or who is recommended to you.
2. Can the course offerings be more often? Course offerings depend upon student demand and faculty availability.
3. Who is responsible for the program in Engineering and in Business? The responsibility for the program in Engineering is Dr. Sadat, in Business-Dr. Halati.

4. How can I arrange for a committee? Ask your Advisor for suggestions. Consider faculty members from whom you have taken courses. Ask faculty members early-on in your program-do not wait until the last minute.