

# Engineering Management, M.S.

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<http://www.eng.uci.edu/admissions/graduate/programs-and-concentrations/engineering-management> (<http://www.eng.uci.edu/admissions/graduate/programs-and-concentrations/engineering-management/>)

The Master of Science in Engineering Management is a graduate degree jointly offered by The Paul Merage School of Business and The Henry Samueli School of Engineering that will prepare engineers for leadership roles in technology, science, government, and engineering-based companies and organizations. The curriculum includes courses in engineering from The Henry Samueli School of Engineering and courses in business administration from The Paul Merage School of Business. Students will emerge as innovators by taking on the role of business and engineering project managers tasked with solving complex engineering product development challenges through consulting projects, business plans, and exposure to current issues within the engineering sector. Through this process, quantitative and qualitative skills along with business communication skills will be developed.

This competitive major teaches business from the engineering perspective and engineering from the business perspective, and students will learn to think about their work through the lens of innovation and to develop a crucial view to enhance their careers.

Applicants apply directly to The Samueli School for the M.S. in Engineering Management. Applicants must meet any applicable prerequisite requirements for the specific engineering specialization they wish to pursue. Admission to graduate standing in The Samueli School of Engineering is generally accorded to those possessing at least a B.S. in engineering or an allied field obtained with an acceptable level of scholarship from an institution of recognized standing. Those seeking admission without the prerequisite scholarship record may, in some cases, undertake remedial work; if completed at the stipulated academic level, they will be considered for admission. Those admitted from an allied field may be required to take supplementary upper-division courses in basic engineering subjects.

The Samueli and Merage Schools will evaluate applicants on their prior academic record and their potential for management and leadership as demonstrated in submitted application materials including work experience and in an interview. These materials will include university transcripts, GRE test scores, letters of recommendation, and a Statement of Purpose. Competitive applicants will be interviewed by the Merage School.

## Master of Science Degree: Plan II: Comprehensive Exam Option

The M.S. degree requires the completion of designated course work which corresponds to a minimum of 17 courses beyond the bachelor's degree. As part of the program, students must complete a two-week orientation and an intensive course in early to mid-September preceding the fall quarter which presents fundamental concepts of management to initiate students into the concrete challenges that managers in high-performing organizations typically confront.

## Core Requirements

Due to the interdisciplinary nature of this degree, it is important to establish a common foundation in Engineering Management for students from various backgrounds. This foundation is sufficiently covered in Engineering Management courses that are listed below and that deal with the following topics:

ENGR 280	Entrepreneurship for Scientists and Engineers
MGMTMBA 200	Thinking Strategically in the Digital Age
MGMTMBA 211	MBA Proseminar (3 quarters)
MGMTMBA 298	Merage Consulting Projects (or equivalent)
Plus, a departmental seminar based on specialization area, for example:	
BME 298	Seminars in Biomedical Engineering
CBE 298	Seminars in Engineering
EECS 294	Electrical Engineering and Computer Science Colloquium
ENGRCEE 295	Seminars in Engineering
ENGRMAE 298	Seminars in Mechanical and Aerospace Engineering

## Electives

**Business.** In addition to the core courses listed above, at least five additional courses from The Merage School of Business are required. (Students will be recommended certain classes based on career tracks they plan to pursue.)

- Three Merage School M.B.A. core courses;
- Two additional courses from a selected group of either core or elective courses.

## M.B.A. Courses

**Core:**

MGMTMBA 201A	Business Analytics: Decision-Making
MGMTMBA 201B	Management Science
MGMTMBA 202	Organizational Leadership for Management
MGMTMBA 203A	Financial Reporting
MGMTMBA 203B	Driving Profitability Through Management Accounting
MGMTMBA 204A	Microeconomics for Management in the Digital Age
MGMTMBA 204B	Macroeconomics for Management
MGMTMBA 205	Marketing Principles
MGMTMBA 207	Competing with Digital: Technology, Analytics, and Platforms
MGMTMBA 208	Operational Excellence: Processes, Models, and Analytics
MGMTMBA 209A	Managerial Finance
MGMTMBA 210	Strategy: Foundations and Dynamics

**Electives:**

Refer to the Business School section of the Catalogue for a list of current M.B.A. electives.

**Engineering.** In addition to the core courses listed above, at least five courses from The Samueli School are required. (Students will be recommended certain classes based on career tracks they plan to pursue.)

- Three courses from a chosen primary specialization in Engineering: Biomedical Engineering, Chemical and Biomolecular Engineering, Civil Engineering, Electrical and Computer Engineering, Materials Science and Engineering, or Mechanical and Aerospace Engineering;
- Two additional elective courses chosen from the primary specialization, from another specialization, or from other courses within or outside The Samueli School as approved by the Director or Director-Elect.

**Approved Specialization Courses****Biomedical Engineering:**

BME 210	Molecular and Cellular Engineering
BME 213	Systems Cell and Developmental Biology
BME 220	Sensory Motor Systems
BME 221	Organ Transport Systems
BME 230A	Applied Engineering Mathematics I
BME 230B	Applied Engineering Mathematics II
BME 233	Dynamic Systems in Biology and Medicine
BME 251	Engineering Medical Optics
BME 260	Microfluids and Lab-On-A-Chip
BME 262	Microimplants

**Chemical and Biomolecular Engineering:**

CBE 249	Special Topics in Chemical Engineering
CBE 261	Molecular Biotechnology
CBE 263	Kinetics of Biochemical Networks
CBE 264	Drug Delivery
CBE 276	Nuclear and Radiochemistry
CBE 282	Colloid Science and Engineering
CBE 288	Optoelectronics Packaging
MSE 241	Nano-Scale Materials and Applications

**Civil Engineering:**

ENGRCEE 220A	Travel Demand Analysis I
ENGRCEE 221A	Transportation Systems Analysis I
ENGRCEE 225B	Transportation Planning Models II
ENGRCEE 229A	Traffic Systems Operations and Control I
ENGRCEE 249	Earthquake Engineering
ENGRCEE 250	Finite Element Method in Structural Engineering
ENGRCEE 258	Earthquake Resistant Structural Design
ENGRCEE 262	Environmental Chemistry II

ENGRCEE 263	Advanced Biological Treatment Processes
ENGRCEE 264	Carbon and Energy Footprint Analysis
ENGRCEE 265	Physical-Chemical Treatment Processes
ENGRCEE 266	Drinking Water and Wastewater Biotechnology
ENGRCEE 272	Groundwater Hydrology
ENGRCEE 273	Watershed Modeling
ENGRCEE 276	Hydrology
ENGRCEE 281	Structural Reliability
<b>Electrical and Computer Engineering:</b>	
EECS 202A	Principles of Imaging
EECS 203A	Digital Image Processing
EECS 211	Advanced System Software
EECS 213	Computer Architecture
EECS 215	Design and Analysis of Algorithms
EECS 217	VLSI System Design
EECS 221	Topics in Computer Engineering
EECS 222	Embedded System Modeling
EECS 225	Embedded Systems Design
EECS 230	Energy Efficiency
EECS 241A	Digital Communications I
EECS 248A	Computer and Communication Networks
EECS 250	Digital Signal Processing I
EECS 261A	Linear Optimization Methods
EECS 267A	Industrial and Power Electronics
EECS 277C	Nanotechnology
EECS 278	Micro-System Design
EECS 279	Micro-Sensors and Actuators
<b>Materials Science and Engineering:</b>	
CBE 264	Drug Delivery
EECS 277C	Nanotechnology
MSE 200	Crystalline Solids: Structure, Imperfections, and Properties
MSE 241	Nano-Scale Materials and Applications
MSE 249	Special Topics in Materials Science and Engineering
ENGRMAE 252	Fundamentals of Microfabrication
MSE 254	Polymer Science and Engineering
MSE 255A	Design with Ceramic Materials
MSE 256A	Mechanical Behavior of Engineering Materials
<b>Mechanical and Aerospace Engineering:</b>	
ENGRMAE 207	Methods of Computer Modeling in Engineering and the Sciences
ENGRMAE 212	Engineering Electrochemistry: Fundamentals and Applications
ENGRMAE 218	Sustainable Energy Systems
ENGRMAE 242	Robotics
ENGRMAE 247	Micro-System Design
ENGRMAE 249	Micro-Sensors and Actuators
ENGRMAE 250	Biorobotics
ENGRMAE 252	Fundamentals of Microfabrication
ENGRMAE 253	Advanced BIOMEMS Manufacturing Techniques
ENGRMAE 259	Mechanical Behavior of Solids - Atomistic Theories
ENGRMAE 270A	Linear Systems I
ENGRMAE 274	Optimal Control