UNIVERSITY OF DETROIT MERCY

We Want Great Things for You

MASTER OF ENGINEERING MANAGEMENT

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Master of Engineering Management

The Master of Engineering Management program at the University of Detroit Mercy (UDM) is an interdisciplinary program – a rich and balanced blend of engineering and management courses as well as the treatment of fundamental, current and the evolving practices. It equips the future and the current managers with skills to face the challenges and opportunities offered by the global competition. IT is a dynamic program – a curriculum continuously enhanced to meet the new and evolving engineering and business challenges.

The Engineering Management Program is distinctive among engineering management programs in its curriculum, responsiveness to the evolving global challenges, and the courses being taught by both seasoned faculty and by industry leaders who bring the real world expertise to the classroom.

A state-of-the-art program is designed for practicing engineers, scientists, technical specialists, and engineering managers to dramatically enrich their technical skills and understanding of engineering and business relationship. The prime target is to better prepare them or enhance their capabilities for engineering leadership positions.

Through the MEM study plan, graduates develop the ability to, understand, evaluate, apply and even create new practices based on sound fundamentals. Through this balanced approach, graduates receive lasting value to their careers and a claim to the title "Technical Professional."

In partnership with International Quality Federation (IQF), the MEM program provides options for **Six Sigma Green Belt and Black Belt Certification**. Courses leading to the certification are open to non MEM students also. A separate write up on the certification program follows the MEM Program information below.

The MEM program objectives are:

• Provide graduates with unique skill set of technical and management skills.
• Equip graduates to recognize the effects of new technology on management issues and tools and processes to leverage them.
• Provide graduates with both an ability to apply engineering principles and a skill in organizing and directing technical projects and people in technical jobs.
• Provide the management tools needed to function competitively in today's challenging times.
• Foster Innovation and Creativity.

In recent years, increasing demands have been placed upon the American engineer/technologist to become a technically, up-to-date manager and leader. An effective response to these requirements is the graduate-level combination of managerial and technical education provided by the University of Detroit Mercy's Master of Engineering Management degree (MEM).

The MEM degree balances the instruction and application of both management and engineering knowledge as well as the treatment of both fundamentals and current practice. The manager, who is trained only in current concepts, without the education in fundamentals, risks the misapplication of sound principles.

Student's who have appropriate engineering or science undergraduate credentials and have a Master's of Engineering degree or a master's degree in a Business or Management field may petition to transfer courses, but a minimum of 24 credit hours must be completed in the MEM program.

The student population in the program is highly diverse both in terms of the organizations they represent and the country of origin. Students come from a wide range of firms including:

• Ford
• GM
• Chrysler
• Visteon
• Delphi
• Arvin Meritor and others.

International students represent countries such as India, Pakistan, China, Taiwan, Iraq, Iran, Palestine, and Mexico among others.

Fast Facts

• Joint Program of Engineering and Business Schools.
• Designed to meet the needs of engineering managers.
• Focused on the automotive industry.
• Delivered at the UDM McNichols Campus, Dearborn, and Troy.
• Personal advising.
• Phone or online registration.
• Online textbook ordering.
• Flexible curriculum to meet individual needs.
• Hundreds of graduates.

Industry Leaders Teaching in the Classroom

Chris Theodore Vice Chairman, ASC Corp. Former Vice President, Product Creation, Ford Motor Company Former Vice President, Product Development, DaimlerChrysler
Jerome Gibbs Executive Vice President, Bing Company Former Executive Director Product Quality, General Motors Corp.
Ali Ozbeki Technical Fellow General Motors Corp.
Chris Aliapoulis Director, Global Product Development Process Ford Motor Co.
Gregg Rasmussen Vice President, Car Business North America SKF-USA
Jeff Manzagol President Kaydon Bearing Corporation
Jim Duprey Chief Financial Officer Kirlin Company

Admission Requirements (U.S. Citizens)

The dean of the College of Engineering and Science, upon recommendation of the program director, approves admission to the program. To be admitted, the applicant must:

• Submit evidence of all undergraduate work and preferably a Bachelor of Engineering from an accredited institution. Applicants with a degree in sciences, such as math, physics, chemistry, or computer science are welcome to apply.
• Have preferably a 3.00 grade point average. Applicants with less than a 3.0 may also apply.
• Have at least 3 years of post-baccalaureate industrial engineering experience. Cooperative and intern experience can be applied to the 3 years experience requirement.
• Submit one letter of recommendation.
• Submit a resume, listing all training and workshops attended.
• Submit a statement of objectives for applying to the MEM program.

Degree Requirements

The program requires 36 semester hours of credit beyond the baccalaureate: 15 credit hours in the engineering management core; 15 credit hours in the technical area of specific interest to the student; and 6 credit hours in management electives.

The program is built around 5 core courses:

EM 5010	Engineering Management
EM 5020	Engineering Economics
EM 5030	Engineering Accounting
EM 5040	Engineering Administration
MBA 5200	Modeling & Executive Decision Making

5 technical elective courses come from among:

E 5020	Design of Experiments
EM 5060	Global Engineering Management & Leadership
EM 5200	Optimization of Engineering Problems
EM 5250	Fuel Cells & Alternative Fuel Transportation
EM 5270	Hybrid Electric Vehicles
EM 5400	Manufacturing Processes, Strategy & Logistics
EM 5420	Manufacturing Productivity
EM 5450	Total Quality Management
EM 5460	Product & Process Improvement Using Lean Six Sigma – Level 1
EM 5470	Product & Process Improvement Using Lean Six Sigma – Level 2
EM 5480	Product & Process Improvement Using Lean Six Sigma – Level 3
EM 5490	Concurrent Engineering
EM 5500	Lean Manufacturing
EM 5600	Lean Product Creation
EM 5700	Systems Architecture & Engineering
EM 5760	Engineering Project Management
EM 5960	Advanced Topics in Engineering Management

Note: Some of the elective courses are listed above. Upon approval of the academic advisor, courses may also be taken from the lists of graduate courses of various engineering departments.

2 management courses come from among:

BUS 5160	Marketing Management
BUS 5190	Production & Operations Management
MBA 5260	Management of Information Systems
MBA 5360	System Simulation
MBA 5380	Advanced Topics in Industrial & Operations Management
MBA 5500	New Product Management

Lean Six Sigma Certification

In the current competitive business environment, industries are striving to improve efficiencies by increasing productivity, enhancing products and services while reducing costs. Lean Six Sigma has emerged as the leading initiative in industry today that enables many managers to achieve these goals. Lean Six Sigma has been widely deployed in a variety of industries including Manufacturing, Medical, Banking' Insurance, Pharmaceutical, Automotive, Aerospace and many more in both manufacturing operations as well as service/business/transactional processes. The Lean Six Sigma strategy combines effective problem solving methodologies, modern quality thinking, process flow analysis and data analysis techniques to help companies solve problems that affect profitability by addressing quality, cost, timing and customer satisfaction. Key positions within a Lean Six Sigma deployment are Green Belt and Black Belt project leaders. These change agents serve as problem solving team leaders and drive the projects necessary to transcend any organization's key performance measurables.

University of Detroit Mercy (UDM) has partnered with the International Quality Federation (IQF) to offer a comprehensive Black and Green Belt Certification program. This program includes a series of "for credit" courses in the Green Belt skill set, Black Belt skill set as well as a class that helps students prepare for the rigorous Six Sigma certification exam and mentors them through an actual industry project.

The series of courses leverage the best of an academic and continuous professional development effort to prepare the students for a challenging industry position as a Black Belt or Green Belt in any organization.

Additionally, those qualified for admission to the university's Masters in Engineering Management (MEM Program) or the Master of Science in Product Development (MPD) Program earn 9.00 credit hours towards their program. They earn the degree and the certification at the same time.

Requirements for Certification-Only

• Submit evidence of all undergraduate work and preferably a Bachelor of Engineering from an accredited institution.
• A working knowledge of the following…

1. descriptive statistics (mean, standard deviation, etc.);
2. basic graphical analysis (scatter plot, histogram, pareto);
3. basic linear regression/correlation (fitting a line); and
4. basic Microsoft Excel (and/or statistical software) skills.

Requirements for Certification & Master's Degree

• Participants must already be registered/meet requirements for admission to the MEM or the MPD Program. Refer to the MEM and MPD Program admission requirements above.

Lean Six Sigma Certification courses are:

EM 5460/MPD 5460	Product & Process Improvement Using Lean Six Sigma – Level 1
EM 5470/MPD 5470	Product & Process Improvement Using Lean Six Sigma – Level 2
*EM 5480	Product & Process Improvement Using Lean Six Sigma – Level 3
**MPD 5990	Capstone/Thesis Research Project

*For MEM students and all non- MPD students
**For MPD students only

Text Requirements

• Breyfogle, Forrest, Implementing Six Sigma: Smarter Solutions Using Statistical Methods, Second Edition. New York: John Wiley and Sons, 2003.

• Locher, Drew, The Complete Lean Enterprise: Value Stream Mapping for Administrative and Office Processes. 2004.

Software Requirements

Minitab, version 14 or 15 and Microsoft Excel.

Learn from the Leading Industry Experts

Don Lynch received his BS in Mechanical Engineering from Michigan Technological University; MBA from Eastern Michigan University; Ph.D. in Mechanical (Industrial) Engineering from Colorado State University; and a post Graduate Certificate in Lean Six Sigma from the University of Michigan.

His professional career includes positions in engineering, quality, design, management and consulting at Ford Motor Company, Diamond Electric Mfg., Visteon Corporation, SKF USA and The University of Michigan. He holds (6) American Society for Quality certifications including Six Sigma Black Belt (CSSBB). He is also a University of Michigan Certified Black Belt and Lean Specialist (manufacturing and office) and an International Quality Federation (IQF), Visteon Corporation and SKF Certified Master Black Belt (MBB). Don also holds certifications from the Institute for Lean Innovation as well as Kepner-Fourie in Critical Thinking. As a three-time MBB Don has completed projects, developed programs, consulted and instructed in all areas of Six Sigma and Lean including manufacturing, office, transactional, product and process design, systematic innovation as well as critical thinking. He has deployed continuous improvement programs for organizations in Japan, Europe and the U.S. He has authored over twenty-five papers, magazine articles, journal entries and presentations on Six Sigma, Lean Continuous Improvement and other related areas. In his current position he is a Senior Lean Six Sigma Master Black Belt and Deployment Director with SKF USA. Don is also an Adjunct Professor at Cleary University in their MBA program and a guest Lecturer and Conference Leader and Consultant for the

University of Michigan College of Engineering and Center for Professional Development.

Bryan Dodson earned a B.S. in petroleum engineering; an M.S. in industrial engineering; an M.B.A from Louisiana Tech University; and a Doctor of Business Administration from Nova Southeastern University. In addition, Bryan is a CQE, CRE and a licensed professional engineer.

Currently Design for Six Sigma Master Black Belt for SKF, Bryan Dodson has held the positions of Associate Director of Quality & Reliability Engineering with Global responsibility for Visteon, Manager of Reliability Engineering and Quality Information Systems - North America at Continental-Teves, TQM Leader and Reliability Leader at Alcoa, and the position of Industrial Engineer at Morton Thiokol. Bryan has authored eight books including: *the Reliability Engineering Handbook*, *Weibull Analysis: with Software, the Six Sigma Black Belt Study Guide, CQE Quick Reference Notes,* and *the Certified Reliability Engineer Examination Study Guide*. He has also developed several software packages including; the *Training Pro* Interactive Study Guides, the *Reliability & Maintenance Analyst*, and *Measurement Assurance*. He served as Chair of the committee that created the International Quality Federation's Six Sigma Examination. He also developed the software that delivers this state of the art exam. Dr. Dodson has published numerous articles in technical journals and teaches several courses for technical societies and as an adjunct faculty member at universities. Dr. Dodson serves as a technical editor for Quality Engineering and as a technical reviewer for Quality Publishing and Addison-Wesley.

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International Students: contact Steven Coddington at coddinsm@udmercy.edu or (313) 993-3310

Courses Descriptions

BUS 5160 Marketing Management **3 cr.**
(Prerequisite: Open to Engineering Management Students only). An introductory study of the management of marketing—a downstream function of business that links the firm to customers, clients, and consumers. Fundamental concepts of marketing are explored including the marketing concept, marketing orientation, customer orientation, as well as several components of the marketing function such as product innovation, new product design, marketing research, product mix, communications mix, retailing, Internet marketing, channels of distribution, pricing, and global marketing. The ethical implications of marketing decisions are also discussed.

BUS 5190 Production & Operations Management **3 cr.**
(Prerequisite: BUS 5120 or equivalent. Open to Engineering Management Students only). An introduction to the concepts and techniques of modern operations management. Design and structuring of operating systems, production planning, inventory control, material requirements planning, project management, facilities layout, operations process, job design, and quality control are studied. Software packages are utilized in the application of these topics.

E 5020 Design of Experiments **3 cr.**
(Prerequisite: MTH 5270). Study of techniques for designing and analyzing experiments such that the results will yield the maximum useful information. Coverage includes: experimental design and analysis, testing of hypothesis, analysis of variance and covariance, graphical techniques, factorials, incomplete blocks, latin squares, response surfaces, and case studies. A team project is required.

EM 5010 Engineering Management **3 cr.**
Provides the manager of engineering and technological resources an understanding of current management principles and practice. Includes impact of global, socio-economic and technological forces which shape the workplace and the management function. Prepares for the increasing complexity of technology management. Major topics include creation and transformation of the organization, decision systems using input from many sources, shaping the organization culture, empowering people and invigorating the organization. Ethics, diversity, quality and global perspective are integrated throughout the course.

EM 5020 Engineering Economics **3 cr.**
Provides the manager of engineering and technological resources a microeconomic foundation for planning and decision-making processes using input from many sources. Emphasis on evaluation of investment projects within a discounted cash flow framework. Covers analysis and decision making with DCF, IRR, present worth, benefit/cost, capital rationing, uncertainty and inflation adjustment. Ethics, diversity, quality and global perspective are integrated throughout the course.

EM 5030 Engineering Accounting **3 cr.**
Provides the manager of engineering and technological resources with an understanding of accounting techniques used by internal company managers of engineering and

technological resources faced with planning, direction, controlling and decision-making using input from many sources. Use of accounting information to identify and analyze alternatives and to guide manager actions which yield the greatest benefit to the company. Covers technical skills for problem solving, e.g. determining unit costs, budgeting, performance indicators, resource allocation, maximizing profit, defining and meeting long-term goals. Ethics, diversity, quality and global perspective are integrated throughout the course.

EM 5040 Engineering Administration 3 cr.
Provides the manager of engineering and technical resources an understanding of current managerial processes influenced by outside forces. Some topics include elements of the management process, organization and restructuring, goal-setting in a complex environment, decision making with input from many resources, effective communication, human resource management, international management implications, and the increasing complexity of social responsibility and ethics within the corporation. Ethics, diversity, quality and global perspective are integrated throughout the course.

EM 5060 Global Engineering Management & Leadership 3 cr.
(Prerequisite: Graduate Standing in Engineering). Students will learn the implications of engineering leadership in a Global environment. Cultural differences will be examined, as well as differences in work practices. Students will become more sensitive to these issues and become more effective in engineering and in leading engineering projects where multicultural influences are present. Specific emphasis will be given to the countries and cultures of regions where automotive companies perform the majority of engineering including multiple European countries, South America, and Asia in contrast with North America. Topics covered will include: (a). Fundamentals of Engineering Management - roles, responsibilities, and measurables; (b) Engineering Management for global competitiveness - challenges and opportunities; © Formal cultural differences in different regions; (d) Informal cultural norms and hands-on observations; (e) Skills, sustainability, work environment, and trade-offs; (f) Implications of these cultural differences in organizing and delivering competitive global initiatives. Case studies will be used throughout the course. Guest Foreign Nationals will be brought in for their first hand observations.

EM 5200 Optimization of Engineering Problems 3 cr.
(Prerequisite: Graduate Standing in Engineering). Foundation of the theory of optimization difficulties with classical calculus approaches, non-linear programming, linear programming with model formulation, sensitivity analysis, integer programming, primal and dual theorems and their applications, dynamic modeling, mixed models, search procedures, network problems, transportation model, etc.

EM 5250 Fuel Cells & Alternative Fuel Transportation 3 cr.
(Prerequisite: Graduate Standing in Engineering). This course will begin with an introduction and overview of the hydrogen economy and the history and application of fuel cells. Questions such as what does moving to a hydrogen economy mean, will be examined. Issues associated with a hydrogen infrastructure will be compared to the advantages and disadvantages of existing energy infrastructure. Alternate or "renewable" energy systems will be described. Hydrogen production, storage and distribution in existing transport networks will be discussed in terms of facilities required, safety concerns and economic viability. Next, fuel cell basics, types of fuel cells and fuel cell systems will be reviewed. This will be followed by fuel cell applications for mobile power, vehicular power and distributed power in stationary systems in buildings. The principles of fuel cell system design and construction will be covered. Comparison of fuel cell systems with other energy production technologies such as combustion engines, batteries, solar and wind will be made. There will be a review of regulations, standards, safety codes and policies for hydrogen utilization. Whether fuel cells meet energy, an environmental and economic expectation so as to achieve maximum market potential is another topic to be addressed. Life cycle costs must be included. Waste handling alternatives for fuel cell systems will be considered. Other factors such as: educating the end user and public at large, risk and reliability, legal aspects, facility management will be covered, as time permits.

EM 5270 Hybrid Electric Vehicles 3 cr.
(Prerequisite: Graduate Standing in Engineering). This course provides an understanding of the state-of-the-art of the hybrid electric vehicle industry from environmental aspects to engineering and manufacturing considerations and customer expectations. It also reviews the evolving trends in the industry. Case studies are used throughout. Each student will select a hybrid vehicle from a given list that he/she will study in detail and use as a reference throughout the course. The vehicle architecture, cost benefit analysis for the consumer as well as the manufacturer's rationale for the vehicle production will be studied. Students will also have opportunities to hear directly from several industry experts and to interact with them one-on-one.

EM 5400 Manufacturing Processes, Strategy & Logistics 3 cr.
(Prerequisite: Graduate Standing in Engineering). Provides an introduction to the various manufacturing process strategies and logistics. Lecture and case studies identify and analyze key activities throughout the product development process that require decision making and management actions by the manufacturing and engineering functions to enhance manufacturing productivity and product quality. Activities include product / process design and validation, launch, program costs, and problem solving. Class assignments include

study of common processes, best practices, and competitive benchmarking.

EM 5420 Manufacturing Productivity 3 cr.
(Prerequisite: Graduate Standing in Engineering). Productivity in the USA and the world, manufacturing engineering and management; manufacturing strategy, manufacturing process flows, layouts and the impact on productivity; role and analysis, critical examination of productivity tools and measures; motion and time study; principles, analysis, evaluation and effects of quality systems on manufacturing productivity; technology blacks to productivity; productivity paradox, role of computers in manufacturing productivity; productivity improvement processes.

EM 5450 Total Quality Management 3 cr.
(Prerequisite: Graduate Standing in Engineering). One of the key elements to enhance global competitiveness of an enterprise is "total quality management". In fact survival of an enterprise depends on its ability to manage this key element. Total Quality Management must be effectively implemented and managed throughout the three major product development phases - "develop product", "produce product", and "sell & support product". During the product development phases engineering and manufacturing management can insure quality / customer satisfaction by identifying the internal and external customers. A review of quality methodologies that measure how defects are proactively eliminated by designing quality into the product and the process will be discussed. Lectures and research will include methodologies / techniques to reduce process variation, validation and testing, six sigma, quality function deployment, Pareto principles, customer feedback systems, lean principles, and continuous improvement. The "high quality value chain" model will be used to highlight milestone deliverables to achieve "world class quality and customer satisfaction". Case studies will be used throughout the course.

EM 5460 Product & Process Improvement Using Lean Six Sigma – Level 1 3 cr.
(Prerequisite: Graduate Standing in Engineering). In the current competitive business environment, industries are striving to improve efficiencies by increasing productivity, enhancing products and services while reducing cost. Six-Sigma has emerged as the leading initiative that enabled many managers to achieve all these goals. Six-Sigma is widely implemented at a variety of industries (medical, banking, insurance, pharmaceutical, automotive, aerospace and many more). This course is intended for industry professionals who seek data to make critical decisions. It will introduce the students to the principles of Six-Sigma. The students will learn how to approach product and process improvement opportunities using the Six-Sigma data driven approach.

EM 5470 Product & Process Improvement Using Lean Six Sigma – Level 2 3 cr.
(Prerequisite: Graduate Standing in Engineering). In the current competitive business environment, industries are striving to improve efficiencies by increasing productivity, enhancing products and services while reducing costs. Lean Six Sigma has emerged as the leading initiative in industry today that enables many managers to achieve these goals. Lean Six Sigma has been widely deployed in a variety of industries including manufacturing, medical, banking insurance, pharmaceutical, automotive, aerospace and many more. The Lean Six Sigma strategy combines effective problem solving methodologies, modern quality thinking, process flow analysis and data analysis techniques to help companies solve problems that affect profitability by addressing quality, cost, timing and customer satisfaction.

EM 5480 Product & Process Improvement Using Lean Six Sigma – Level 3 3 cr.
(Prerequisite: Graduate Standing in Engineering). In the current competitive business environment, industries are striving to improve efficiencies by increasing productivity, enhancing products and services while reducing costs. Lean Six Sigma has emerged as the leading initiative in industry today that enables many managers to achieve these goals. Lean Six Sigma has been widely deployed in a variety of industries including manufacturing, medical, banking insurance, pharmaceutical, automotive, aerospace and many more. The Lean Six Sigma strategy combines effective problem solving methodologies, modern quality thinking, process flow analysis and data analysis techniques to help companies solve problems that affect profitability by addressing quality, cost, timing and customer satisfaction.

EM 5490 Concurrent Engineering 3 cr.
(Prerequisite: Graduate Standing in Engineering). Concurrent Engineering (CE) is a systematic approach to the integrated, concurrent design of products and their related processes, including manufacture and support; co-design of all desired down steam characteristics during upstream phases to produce a more robust product at less cost and faster than sequential design.

EM 5500 Lean Manufacturing 3 cr.
(Prerequisite: Graduate Standing in Engineering). This course is designed to provide lean manufacturing solutions to production processes that delivery best in class performance in cost, working capital, and product lead time. It covers tools, techniques, and processes to reduce cycle time, reduce inventory, reduce material cost, and enhance effectiveness of the supply chain. Topics covered include issues with the common manufacturing processes, elimination of waste, 5S-the foundation, value stream mapping, engineering standards, ergonomics, and workplace design among others. Case studies are used throughout the course.

EM 5600 Lean Product Creation 3 cr.
(Prerequisite: Graduate Standing in Engineering). In today's globally competitive environment, a company's success is dictated by the quality of the products it can bring to the market with speed, cost effectiveness and ahead of the competition. The product creation teams need to be fast, efficient, highly effective, and flexible to adapt to the changing market demands. Waste must be eliminated from all stages of product creation. This course addresses the issues, challenges, and opportunities related to lean product creation. Various tools, techniques, and processes are also discussed. Case studies are used throughout the course.

EM 5700 Systems Architecture & Engineering 3 cr.
(Prerequisite: Graduate Standing in Engineering). This course will demonstrate the need for robust systems architecture and engineering in a product development process. It will use texts, case studies, and class projects to illustrate key points and highlight successes and failures that can be traced to a product's underlying architecture and systems engineering. Students will learn the fundamentals of systems architecture and engineering and be able to avoid common oversights in the product development process.

EM 5760 Engineering Project Management 3 cr.
(Prerequisite: Graduate Standing in Engineering). This course provides an introduction to the economic, contractual, managerial, and societal issues related to the management of engineering projects. The economic analysis includes the comparison of initial and life-cycle costs. The contractual issues include project delivery systems. The managerial issues include scheduling, procurement, and quality control/quality assurance. The societal impacts include green design, and interaction with the public. The format of the class includes case studies and projects. The projects include the use of software.

EM 5960 Advanced Topics in Engineering Management 3 cr.
(Prerequisite: Graduate Standing in Engineering). Special topics in engineering management to be taken with academic advisor's approval with be covered under this course number.

MBA 5200 Modeling & Executive Decision Making 3 cr.
(Prerequisite: CSC 515). Large-scale Software Systems Design methods, Fundamental Design Concepts, Design Notations, Design Methods Comparison, Structure Design, State-Based Design, Object-Oriented Design, Engineering Principles of Software Design, Software Design Case Studies, Projects.

MBA 5260 Management of Information Systems 3 cr.
(Prerequisite: CSC 515). Large-scale Software Systems Design methods, Fundamental Design Concepts, Design Notations, Design Methods Comparison, Structure Design, State-Based Design, Object-Oriented Design, Engineering Principles of Software Design, Software Design Case Studies, Projects.

MBA 5360 System Simulation 3 cr.
(Prerequisite: CSC 515). Large-scale Software Systems Design methods, Fundamental Design Concepts, Design Notations, Design Methods Comparison, Structure Design, State-Based Design, Object-Oriented Design, Engineering Principles of Software Design, Software Design Case Studies, Projects.

MBA 5380 Advanced Topics in Industrial & Operations Management 3 cr.
(Prerequisite: CSC 515). Large-scale Software Systems Design methods, Fundamental Design Concepts, Design Notations, Design Methods Comparison, Structure Design, State-Based Design, Object-Oriented Design, Engineering Principles of Software Design, Software Design Case Studies, Projects.

MBA 5500 New Product Management 3 cr.
(Prerequisite: CSC 515). Large-scale Software Systems Design methods, Fundamental Design Concepts, Design Notations, Design Methods Comparison, Structure Design, State-Based Design, Object-Oriented Design, Engineering Principles of Software Design, Software Design Case Studies, Projects.

MPD 5990 Capstone/Thesis Research Project 3 cr.
(Prerequisite: CSC 534). Database system architecture, the relational model, database design, transaction management, security, optimization, missing information, type inheritance, distributed database, decision support, temporal database, logic-based databases, object database, object relational database, projects.

University of Detroit Mercy
Graduate Program in Engineering Management
Admission Recommendation

Name of Applicant_____ Social Security Number _____

Applicant: This form is to be given to your supervisor/manager who is able to attest to your preparedness for the program and support from the organization.

My preference regarding confidentiality of this recommendation is as follows:

_____ I wish to have access to this letter of recommendation; it will not be confidential and will be incorporated into my application for graduate study.

_____ I waive my right of access to this letter of recommendation and request it be incorporated as confidential material into my application for graduate study.

(Signature) (Date)

Note to Recommender: The person named above is applying for admission to the graduate program indicated and has requested that your evaluation be included as part of the information in which the faculty will base its decision. Under THE FAMILY EDUCATIONAL RIGHTS AND PRIVACY ACT of 1974, this applicant (if admitted and enrolled) will have access to the information provided unless the statement above has waived the right to such access.

Please indicate your relationship to the applicant and how long you have known him/her. Describe the general qualities of the candidate and why you think he/she is a good match to the MEM Program (What sets this applicant apart from others?). Indicate how you assess the candidate's leadership skills. If possible, describe a leadership situation that you have witnessed the applicant in. Where do you see this applicant in five or ten years relative to your organization?

Organizational Commitment:
Recommending an applicant for the MEM Program acknowledges an organizational commitment to the Program. The MEM Program is rigorous and requires a higher level of involvement by the student's employer than most traditional master's programs. The following support from the student's organization is anticipated:

1. Accommodate, where possible, the study and learning demands of this rigorous Program. The Program is designed around cohorts of students pursuing the Program in sequence through to completion.
2. Each student will work on class and capstone projects that are closely coupled to product development. Where possible, these should be tied to challenges facing the product development activities of the student's organization.
3. Ideally, the student's roles and responsibilities at work will compliment and capitalize on the product development competencies that are outcomes of the MEM Program.

The student's management is best prepared to provide support to this educational process by participating in a program orientation and on-going professional development activities.

Signature:_____ Date:_____

Print Name:_____

Company:_____ Division:_____ Mail Drop:_____

Address_____

Telephone:_____ FAX: _____ Email:_____