

Memorandum

To: University Senate
From: Eric C. Bielefeld, Chair, Council on Academic Affairs
Subject: Proposal to Establish the Master of Engineering Management Degree Program
Date: April 2, 2019

A PROPOSAL FROM THE COUNCIL ON ACADEMIC AFFAIRS TO ESTABLISH THE MASTER OF ENGINEERING MANAGEMENT DEGREE PROGRAM, COLLEGE OF ENGINEERING

Whereas this is a post-baccalaureate professional degree aimed at practicing engineers, with a title that conveys both the technical aspects of an engineering degree and the important management and leadership skills necessary for success in business management and economic, social, and political domains, and with a target audience of engineers from the public or private sectors who have been in the field 3-10 years; and

Whereas the degree program is aligned with the College of Engineering's Strategic Plan updated in 2018; and

Whereas it is a 30 semester credit hour program (core and elective courses and a capstone course), that students can complete on a full or part time basis, with content for the degree provided by faculty in the College of Engineering and content experts in the John Glenn College of Public Affairs and the Fisher College of Business, and with delivery by distance education technology; and

Whereas following review by the combined Graduate School/Council on Academic Affairs subcommittee, the proposal was reviewed and approved by the Council on Academic Affairs at its meeting on March 20, 2019;

Therefore be it resolved that the University Senate approve the proposal to establish the Master of Engineering Management degree program and respectfully request approval by the Board of Trustees.

TO: Randy Smith, Vice Provost for Academic Programs
FROM: Jennifer Schlueter, Faculty Fellow for Curriculum, Graduate School
DATE: 26 February 2019
RE: Proposal to for a Master of Engineering Management

The College of Engineering in partnership with the John Glenn College of Public Affairs and the Fisher College of Business is proposing a new Master of Engineering Management. This degree is “a professional program aimed at practicing engineers seeking to increase their management and leadership skills.” It requires 30 credit hours and may be undertaken on a full- or part-time basis.

The proposal was received by the Graduate School on 26 October 2018. It was reviewed by the combined GS/CAA Curriculum subcommittee, co-chaired by Associate Dean Shari Speer and Faculty Fellow Jennifer Schlueter, on 29 November 2018. Revisions were requested 2 December 2018 and received 18 December 2018. It was moved forward to the Graduate Council, where it was reviewed and unanimously approved by that body on 22 February 2019.

From: [Mick, Robert](#)
To: [Schlueter, Jennifer](#)
Cc: [Quinzon-Bonello, Rosario](#); [Speer, Shari](#); [Toft, Jill A.](#); [Benatar, Avi](#)
Subject: RE: proposal for a new Master of Engineering Management
Date: Tuesday, December 18, 2018 3:05:13 PM
Attachments: [MasterEngineeringManagement_Proposal_Revised_forGradSchool.pdf](#)

Dr. Schlueter,

The revised Master Engineering Management proposal is attached including a cover sheet with answers to the committee's questions. We also met with Dr. Sheer this week regarding the fuller proposal and thank you for that recommendation.

Please let me know if you have any questions.

Thank you,

Bob Mick

Director
Professional & Distance Education Programs Office
Master Global Engineering Leadership ([MGEL](#))
The Ohio State University College of Engineering
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614-292-0393 Office
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From: Quinzon-Bonello, Rosario <quinzon-bonello.1@osu.edu>
Sent: Monday, December 3, 2018 12:14 PM
To: Mick, Robert <mick.15@osu.edu>
Cc: Tomasko, David <tomasko.1@osu.edu>
Subject: FW: proposal for a new Master of Engineering Management
Importance: High

Hello Bob,

I am forwarding you feedback from Jen Schlueter, who is chair of the Graduate School/CAA curriculum subcommittee.

When you submit a revision to her, can you please copy me, as well?

Thanks,

Rosie

From: Schlueter, Jennifer <schlueter.10@osu.edu>
Sent: Sunday, December 2, 2018 7:38 PM
To: Quinzon-Bonello, Rosario <quinzon-bonello.1@osu.edu>
Cc: [Speer, Shari](mailto:Speer.21@osu.edu) <Speer.21@osu.edu>; [Toft, Jill A.](mailto:Toft.20@osu.edu) <Toft.20@osu.edu>

Subject: proposal for a new Master of Engineering Management

Dear Professor Quinzon-Bonello:

At its 29 November 2018 meeting, the combined Graduate School/CAA curriculum subcommittee, which I chair as Faculty Fellow, reviewed your proposal for a new Master of Engineering Management. The subcommittee was enthusiastic about this new program and are eager to see this proposal move forward. We have a few requests for revision before we can do so, however. As you revise, I invite and encourage you to meet with Associate Dean Shari Speer to discuss this and the fuller proposal that will ultimately go “downtown” before the Chancellor’s Council on Graduate Studies.

When you submit your revised proposal to the subcommittee, please include a cover sheet that points us to where in the revision we can find your responses to our queries.

1. Because this program will be 100% online, an MOU with the Office of Distance Education and eLearning must be in place. More information is available here <https://odee.osu.edu/program-development>
2. Because this proposal will be reviewed by faculty outside your discipline, some terminology either presents a barrier to comprehension or opens the door to confusion because it is deployed differently between programs. For the subcommittee, terms like “Lean Sigma” fit the former category; “Sensemaking” fit the latter. If you can find ways to help the layperson follow along, we’d be grateful.
3. Can a student complete this program in one year if they choose?

Upon receipt of your revised proposal, the subcommittee will revisit. You may wish to meet with Associate Dean Speer before doing so.

All the best,

Jen

Jennifer Schlueter, PhD

Associate Professor and **Lab Series Producer:** Department of Theatre

Project Director: Social Change, Community Engagement, and Creative Practices Discovery Theme

Faculty Fellow for Curriculum: Graduate School

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Date: December 18, 2018

RE: Proposal for a new degree program Master Engineering Management (MEM)
Response's for Graduate School / CAA curriculum subcommittee

Dear Committee Members:

Please find attached our revised proposal that includes answers to your questions listed below:

1. Because this program will be 100% online, an MOU with the Office of Distance Education and eLearning must be in place. More information is available here <https://odee.osu.edu/program-development>

Answer: The MOU is attached.

2. Because this proposal will be reviewed by faculty outside your discipline, some terminology either presents a barrier to comprehension or opens the door to confusion because it is deployed differently between programs. For the subcommittee, terms like "Lean Sigma" fit the former category; "Sensemaking" fit the latter. If you can find ways to help the layperson follow along, we'd be grateful.

Answer: An Appendix E has been added that includes course descriptions.

3. Can a student complete this program in one year if they choose?

Answer: No. But students can complete the degree in as few as four semesters and it depends upon which term they begin enrollment. This information has been added to the proposal page 2, last paragraph. Appendix C has also been revised to show additional sample study plans.

Sincerely,

Bob Mick and Dr. Avi Benatar

THE OHIO STATE UNIVERSITY
College of Engineering
Proposal for a professional Master of Engineering Management degree

Executive Summary

The proposed Master of Engineering Management (MEM) degree is a professional program aimed at practicing engineers seeking to increase their management and leadership skills. MEM degrees are technically based programs that teach methods to manage business initiatives, projects and team members in an engineering setting. These methods can be applied throughout any engineering discipline. Courses in Master of Engineering Management programs are designed to develop an understanding of how to manage both the technological and human resources sides of engineering. The MEM program is designed for working professionals and will be delivered completely online.

I. Introduction and Overview

The College of Engineering (CoE) at The Ohio State University, in partnership with the John Glenn College of Public Affairs and The Fisher College of Business, proposes a new professional master's degree in Engineering.

a) *Designation*

The degree will be called the Master of Engineering Management (MEM).

b) *Rationale*

The proposed degree is a professional degree at the post-baccalaureate level aimed at practicing engineers. It is not a research degree and thus the Master of Science degree is not appropriate. The title of Master of Engineering Management is intended to convey both the technical aspects of an engineering degree and the equally important management and leadership skills necessary to succeed in a business management as well as in economic, social and political domains.

The target audience for the MEM degree is engineers in business, industry and government who have worked in the field for three to ten years. More recent graduates will also be considered for the program based on their qualifications and experience, but the focus is on early to mid-career engineering professionals. Prospective students may be employed in either the public or private sectors (for profit or non- profit). They aspire to learn engineering management skills that prepare them to be leaders in their organizations.

c) *Purpose, Focus and Significance*

Master of Engineering Management degrees bridge the gap between the fields of engineering and business management. MEM degrees are technically based programs that teach methods to manage business initiatives, projects and team members in an engineering setting. MEM coursework typically includes topics such as project management, leadership, team building, innovation, and financial management.

The College of Engineering launched a technically based program in Autumn 2014,

the online Master Global Engineering Leadership (MGEL) degree. The MGEL is similar to other existing MEM degrees because the core curriculum includes courses in business and policy. What separates the MGEL from traditional MEM degrees is its inclusion of a technical track – four specialized, advanced engineering courses in a single discipline (e.g. automotive systems engineering) like a traditional MS student may take. (See Appendix A for complete MGEL curriculum)

The College of Engineering Strategic Plan, revised in 2018, calls for the addition of a traditional MEM degree in order for the college to meet the needs of students from two different populations. Students who enroll in the existing MGEL program are likely to lead technical teams in a singular engineering discipline matching the area of their chosen technical track, while MEM students are likely to be desirous of growing their careers with general management positions in a variety of engineering environments.

The content for the Master of Engineering Management degree will be provided by faculty in the College of Engineering, content area experts in the John Glenn College of Public Affairs and The Fisher College of Business. The delivery by distance education technology provides the ideal environment for working professionals.

Engineers who complete the MEM will be able to:

- understand the numbers in financial statements, apply the fundamentals of managerial accounting to manage projects to success, and support the financial objectives of an organization;
- lead diverse, effective teams in innovative directions including projects in the context of their enterprise's overall strategic mission, whether in the public or private sector, including the implications of managing globally;
- evaluate performance and conduct productive communication with business leaders, teams, and subordinates;
- understand intrapreneurship and entrepreneurship to advance new products and services and apply knowledge more effectively in innovative directions;
- learn information visualization techniques that help managers analyze massive amounts of digital data to combat overload and aid sensemaking with engineering applications in business and financial decision making;
- understand the complexities between science, engineering, and public policy, while recognizing the importance of global trends in their fields from the entire curriculum and capstone course.

II. Proposed Curriculum

The proposed curriculum is a minimum of 30 semester credit hour program. Students have the flexibility of taking the curriculum on a full or part time basis. Depending upon their term of enrollment, students may complete the degree in as little as one and a half years. All students must complete the degree within four years unless the Graduate Studies Committee (formed specifically for this program) grants an extension. Students may be awarded up to three hours of credit for previous coursework completed elsewhere. (See Appendices B & C for more details) The curriculum includes three components with course descriptions in Appendix E:

a) The Required Core (15-16 credit hours):

This integrated core includes business, public administration and engineering courses including topics such as engineering leadership, project management, innovation, entrepreneurship, teambuilding, and financial accounting.

- ENGR 6210 Leadership and Team Effectiveness (3 credits)*
- ENGR 6220 Accounting/Finance for Engineers (3 credits)
- ENGR 6230 Technology Strategy & Innovation Management (3 credits)
- ISE 6801 Project Management (3 credits)
- ISE 5760 Visual Analytics for Sensemaking (3 credits)
- PUBAFRS 6050 Management in Public Agencies (4 credits)*
- PUBAFRS 6060 Managerial Leadership in Public and Nonprofit Organizations (3 credits)*

*Students take either ENGR6210, PUBAFRS 6050 or PUBAFRS 6060 depending on whether they are focused on the public or private sector. PUBAFRS 6050 or PUBAFRS 6060 can be taken as an elective if ENGR 6210 is chosen.

b) Electives (12 credit hours)

The elective courses provide opportunities for students to enhance their engineering management in areas of sustainability, global supply chains, risk analysis, policy, and data analytics. Students select courses from the following to full-fill the electives portion of the curriculum:

- ENGR 7200 Engineering Ethics and Professionalism (1 credit)
- ISE 5810 Lean Sigma Foundations (4 credits)
- ENVENG 6600 Assessment for Human Rights and Sustainability (3 credits)
- ENVENG 5600 Science, Engineering and Public Policy (3 credits)
- PUBAFRS 5610 Innovation, Policy, and the Global Economy (3 credits)
- PUBAFRS 5750 The Business-Government Relationship (3 credits)
- PUBAFRS 5770 Risk and Decision Analysis in Public Affairs (3 credits)
- PUBAFRS 6075 Data, Models & Evaluation (3 credits)
- MBA 6233 Operations Management (3 credits)
- BUSMHR 7244 Negotiation (3 credits)
- MBA 6273 Data Analysis for Managers (3 credits)
- MBA 6253 Marketing Management (3 credits)

Note: Students can take a max. 10 hrs in PUBAFRS courses from the core and electives.

c) Capstone Course (3 credit hours)

The capstone course is a culminating experience providing students the opportunity to solve real-world challenges by utilizing skills learned from all the MEM courses, while implementing the principles of operational excellence and lean systems in an organization. (Proposed course syllabus in Appendix D)

- ENGR 6XXX Capstone Project in Operational Excellence for Engineers (3 credits)

III. Administrative Arrangements (Details on arrangements are in Appendix B)

The MEM degree will be administered by the College of Engineering through the Professional and Distance Education Programs Office. The MEM Graduate Studies Committee (GSC) will be established within the College to coordinate the operation of the program.

a) *Graduate Studies Committee (GSC)*

The MEM Faculty Director will act as the chair of the MEM-GSC. The MEM-GSC will consist of these voting members: the MEM Faculty Director, one representative from the John Glenn College of Public Affairs, one representative from the Fisher College of Business, and two Engineering faculty who teach MEM courses. The MEM-GSC will include the College of Engineering Director of Professional and Distance Education Programs and the PDEP Program Coordinator as non-voting members.

b) *Office of Distance Education and eLearning (ODEE)*

The proposed program will be developed in partnership with the Office of Distance Education & eLearning (ODEE).

c) *Industry Advisory Board (IAB)*

The Industry Advisory Board for the MGEL degree will also be utilized and engaged for the MEM degree to help ensure the curriculum remains relevant to the needs of industry.

d) *MEM Operations*

The Director of Professional and Distance Education Programs (PDEP) in the College of Engineering will be responsible for the overall administration of the MEM degree. The PDEP Program Coordinator for the MGEL degree will also act as the Program Coordinator for the MEM and be responsible for the day-to-day operations.

IV. Evidence of Need

The College of Engineering conducted extensive research for the development of the MGEL degree that is also relevant and provides evidence of need for the MEM. More importantly, the PDEP office that manages the MGEL degree has collected additional and significant information and data providing evidence of need for the MEM degree.

There are many universities that offer traditional Master of Engineering Management degrees. The college's MGEL degree was intended to be a unique version of an MEM with the addition of a technical track. While the MGEL has had strong interest, there has been a significant number of requests for a more traditional program.

Since 2014, the MGEL program has received 597 direct program inquiries through email, phone calls, and online information sessions. Of the 597 inquiries, 401 potential students stated that while they were interested in the program, they would not apply because our technical tracks were not of interest to them and they wanted to pursue a traditional MEM.

Based on the large number of direct inquiries including those who have spoken out in favor for an OSU MEM degree, there is a strong evidence of need. Additionally, there is a very low cost associated with developing the MEM degree. The core courses of the MEM and MGEL will be very similar, reducing the need for additional resources. The MEM and MGEL will be great compliments to each other and the college can increase enrollment in existing courses and professional education programs overall, while also meeting the needs of potential students and alumni.

In Ohio, Case Western Reserve University offers a Masters of Engineering as well as Ohio University. Our MEM degree will be unique from their offerings because of the partnership with other content area specialists in the John Glenn College of Public Affairs and The Fisher College of Business. The courses in Operational Excellence and Data Analytics will also differentiate our degree. The addition of an MEM from OSU will strengthen engineering education in the state.

V. Prospective Enrollment and Student Demand

a) Demand

Based on our marketing data and inquiries for the MGEL degree, we believe the MEM program will quickly enroll 10-20 students in the first year and grow to 30-50 students afterwards.

b) Access and Retention of underrepresented Groups

Details in Appendix B.

VI. Available Resources and Additional Costs

The MEM degree program will use current faculty already teaching in the MGEL degree. Administrative support for the MGEL degree will also be able to manage the MEM degree. The MEM will also enable the college to achieve maximum utilization of the core courses of the MGEL degree as they will be included in the MEM. The only additional costs required for the MEM will be compensation to faculty for development time when converting their courses into online format.

VII. Assessment Plan

The MEM administration will continuously assess all of the program's activities. This will be accomplished in several ways. Details in Appendix B.

Proposal Contact Information

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Professional & Distance Education Programs
Mick.15@osu.edu 614-292-0393

Dr. Avi Benatar
Associate Professor
MGEL Graduate Studies Chair
Benatar.1@osu.edu 614-292-1390

Appendix A

Master Global Engineering Leadership Curriculum				
Course Courses (16-17 cr hrs)				
	Dept	Course #	Course Names	Cr Hrs
Core	ENGR	6210	Leadership and Team Effectiveness	3
Core	ENGR	6220	Accounting/Finance for Engineers	3
Core	ENGR	6230	Technology Strategy & Innovation Mgmt	3
Core	PUBAFRS	6050	Management in Public Agencies	4
Core	PUBAFRS	5750	The Business-Government Relationship	3
Core	ENGR	7200	Engineering Ethics and Professionalism	1
Core	ISE	6801	Project Management	3
				16-17
	Note: Students select either PUBAFRS 6050 or ENGR 6210			
Technical Track Specializations (12 cr hrs)				
Automotive Systems Engineering Track (students select two focus areas)				
Focus Area 1: Advanced Propulsion Systems (can be taken in any order)				
	ME	7383	Electrochemical Energy Conversion and Storage Systems for Automotive Applications	3
	ME	7384	Energy Modeling, Simulation, Optimization and Control of Advanced Vehicles	3
Focus Area 2: Powertrain Modeling and Control (must take 7236 before 5554)				
	ME	7236	Powertrain Dynamics	3
	ECE	5554	Powertrain Control Systems	3
Focus Area 3: Dynamic Systems and Engine Modeling (can be taken in any order)				
	ME	5339	Simulation Techniques for Dynamic Systems	3
	ME	7440	Internal Combustion Engine Modeling	3
Enterprise Systems and Architectures track				
	CSE	5231	Enterprise Software Engineering	2
	CSE	5234	Applied Enterprise Distributed Computing for Engineers and Scientists	3
	CSE	5235	Enterprise Services and Architectures	3
	CSE	5241	Introduction to Databases	2
	CSE	TBD	Independent Study (1 hr for 5241; 1 hr for 5231)	2
Welding Engineering				
	WELDENG	7001	Physical Principles in Welding Processes I	3
	WELDENG	7101	Welding Metallurgy I	3
	WELDENG	7201	Engineering Analysis for Design and Simulation	4
	WELDENG	7406	Welding of Plastics and Composites	3
Radar Systems				
	ECE	5010	Wireless Propagation and Remote Sensing	3
	ECE	5206	Medical Imaging and Processing	3
	ECE	5011	Antennas	3
	ECE	5013	An Introduction to Radar Systems	3
Civil and Environmental Track				
	ENVENG	6600	Assessment for Human Rights and Sustainability	3
	ENVENG	5600	Science, Engineering, and Public Policy	3
	ENVENG	5195	Engineering Design for Environmental Health	3
	CIVILEN	6100	Advanced Topics in Surveying for Smart Cities	3
Integrative Project (5 cr hrs)				
	ENGR	7100	Integrative Project	5

Appendix B

Processes

I. Selection of Personnel

Faculty Director

The MEM Faculty Director will be selected by the Dean of the College of Engineering and the MGEL Graduate Studies Committee (MGEL-GSC). The MEM Faculty Director will serve at the pleasure of the Dean in a half time administrative role. The MEM Faculty Director will have graduate faculty status with the Graduate School.

Administrative Staff

The Director of Professional and Distance Education Programs (PDEP) will act as the MEM Director and report to the Dean of the College of Engineering. A MEM Program Coordinator will be selected and report to the Director of Professional and Distance Education Programs.

II. Master Engineering Management –Graduate Studies Committee (MEM-GSC)

The MEM Faculty Director will act as the chair of the MEM-GSC. The MEM-GSC will consist of these voting members: the MEM Faculty Director, one representative from the John Glenn College of Public Affairs, one representative from the Fisher College of Business, and two Engineering faculty who teach MEM courses. All voting members of the MEM-GSC will have graduate faculty status with the Graduate School. The MEM-GSC will include the College of Engineering Director of Professional and Distance Education Programs and the PDEP Program Coordinator as non-voting members. The MEM-GSC will handle all tasks normally associated with a graduate studies committee (admissions, new courses, progress of students, and so on).

III. Industry Advisory Board

The MEM will benefit from a strong industry advisory board to ensure that the degree and curriculum is relevant to the needs of industry. The MGEL Industry advisory board members will be engaged and utilized as well for the MEM degree.

IV. Admissions

a) MEM Entrance Requirements

The Masters of Engineering Management program normally requires a candidate to have a B.S. in Engineering from an accredited program (ABET, CAB) at a college or university. The admissibility of a candidate with a BS not in engineering will be evaluated by the MEM-GSC acting as the admissions committee for the degree program.

Applicants for admission to the MEM degree program must have a cumulative point hour ratio for undergraduate work of at least 3.0 (4.0 scale). Applicants with cumulative point hour ratios for undergraduate work below 3.0/4.0 must submit results for the GRE General Test to be considered for admission.

The MEM-GSC may request applicants with a B.S. engineering degree from a non-ABET or non-CAB (Canadian Accreditation Board) accredited program to submit the results of the GRE General Test.

Applicants with non-engineering BS degrees will usually be required to take specified makeup work before their applications will be considered for graduate admission. These applicants may also be required to submit the GRE General Test results regardless of grade point average.

b) Professional Work Experience

Students applying to the MEM will normally have at least a year of post-B.S. work experience in an engineering-related job. The MEM-GSC may, however, choose to admit exceptional students directly from the B.S. Any such student must have significant internship, co-op, or work experience that will enable them to bring something to the classroom and will allow them to appreciate the professional skills that make up the MEM core. This will normally imply at least two internships or co-op experiences; however the exact requirement may vary by student at the discretion of the MEM-GSC.

c) Student Progress

Students must complete the degree within four years. Student progress will be tracked by the MEM Program Coordinator and reported to the MEM Director and MEM-GSC. The Director and the Program Coordinator will work together to ensure that all students make good progress toward completion of the degree.

d) Credit for previous course work

Students may obtain up to three semester hours of credit for class work outside of the MEM curriculum. The decision to grant credit or not and the amount of credit granted will be made by the MEM-GSC upon application of the student.

e) Partner Colleges

A key strength of the MEM program is its ties to partner Colleges within OSU. It is important that these relationships be carefully fostered by the PDEP Director and the MEM-GSC. Each partner will be asked to identify voting representative to the MEM-GSC so that the partner's interests and concerns can be represented on the committee. The PDEP Director will also meet with each of these representatives (individually or as a group) at least once a year to discuss how the program is going and any concerns or issues that the partners' representatives wish to bring forward.

Access and Retention of Underrepresented Groups

Excellence cannot be achieved without diversity and the diversification of the engineering student body is a major priority for the College of Engineering as indicated in the College's Strategic Plan. According to this goal, the College will "Increase the diversity of students, faculty and staff". The college has a well- established and nationally-respected Minority Engineering Program (MEP). It was founded as part of a national effort to increase the representation of African- Americans, Hispanic-Americans, and Native Americans in the professional engineering population. MEP offers a wide range of programs and services to assist in the recruitment, retention, motivation and graduation of minority students. Some of these include: academic and personal counseling, an early-warning monitoring system, a test and reference library, skills-building workshops, and social activities.

Similarly, the College of Engineering established the Women in Engineering (WiE) Program to encourage young women to consider engineering as a career choice, to recruit women into undergraduate and graduate programs, to support women as they matriculate through the engineering programs, and to assist women as they transition to the workforce after graduation. The resources that reside within these two programs are very effective in their charges and their services will continue to evolve as the needs of the MEM degree emerge. In addition, the MEM will have access to OSU's many resources for recruiting and retaining under-represented groups. Linkages with national organizations of minority and women engineers (such as the National Society of Black Engineers, the Society of Hispanic Professional Engineers, and the Society of Women Engineers) are already in place and thriving in the College. The College actively recruits

from these organizations and also works from GRE lists and the Summer Research Opportunity Program (SROP) lists.

In the marketing of the program we will use all of OSU's resources and make every effort to recruit members of underrepresented groups. The MEM offers an outstanding opportunity to enhance the careers of female and minority engineers and, in the process, create more role models to improve the diversity of engineering in general.

Consistent with the University's Diversity Plan, efforts to recruit and retain engineers who are members of the GLBT community are receiving increasing emphasis in the College of Engineering. Recruitment efforts through an established link with the National Organization of Gay and Lesbian Scientists and Technical Professionals will be engaged to assist in bringing additional diversity to the MEM program. Retention efforts for GLBT engineers are beginning to be addressed within the context of the College's evolving diversity plan and within the College's updated Performance Plan.

Assessment Plan

The MEM administration will continuously assess all of the program's activities. This will be accomplished in several ways.

The most important measure is the satisfaction of the students. In order to gauge this metric, the MEM administration will send individual emails to newly admitted students during the first two weeks of classes to ask if everything is going well and to determine if they're having any problems acclimating as an online student in the degree. Upon the completion of the first semester, students will be provided a short survey to assess their satisfaction with the program covering topics not included in the university's SEI. A program exit survey will be provided to graduating students. All of these surveys will be reviewed by the program administration and MEMGSC and corrective action taken regarding any substantiated negative feedback. If any student leaves the program or doesn't enroll in any classes for two consecutive semesters without explanation, the PDEP Director will contact the student and attempt to learn why.

The MEM Graduate Studies Committee will have a curriculum assessment plan which will consider both the core and elective courses in the degree. Faculty involved in the program will have constant opportunities to evaluate the distance education facilities and other aspects of the program. The PDEP Director will summarize these evaluations in an annual report to the College's Dean.

All constituencies will be asked to evaluate the level of customer service, the ease of use of the distance education facilities and products, the value of the different aspects of the program and the overall quality of the degree on a regular basis. It will be the responsibility of the Director to summarize all evaluations in an annual report, to determine in consultation with the GSC and the Dean when there are problems requiring action and to determine what action should be taken.

Appendix C: Sample Plan of Study

The Master of Engineering Management is designed to be completed in 1.5-4 years

Master of Engineering Management (Sample 4 semester plan of study)							
Year 1 Spring		Year 1 Summer		Year 1 Autumn		Year 2 Spring	
Course	Cr Hrs	Course	Cr Hrs	Course	Cr Hrs	Course	Cr Hrs
PUBAFRS 5750 Business/Government Relationship	3	ISE 6801 Project Mgmt	3	ENGR 6220 Accounting/Finance for Engineers	3	ENGR 6XXX Capstone Project in Operational Excellence for Engineers (Capstone Course)	3
ISE 5760 Visual Analytics for Sensemaking	3			ENGR 6210 Leadership & Team Effectiveness	3		
PUBAFRS 5610 Innovation, Policy & Gobar Economy	3			ENGR 6230 Technology Strategy & Innovation Mgmt	3		
ENVENG 5600 Science, Engineering and Public Policy	3			ENVENG 6600 Assessment for Human Rights	3		
Total Hours	12		12		12		3

Master of Engineering Management (Sample 5 semester plan of study)								
Year 1 Autumn		Year 1 Spring		Year 1 Summer		Year 2 Autumn		Year 2 Spring
Course	Cr Hrs	Course	Cr Hrs	Course	Cr Hrs	Course	Cr Hrs	Course
ENGR 6220 Accounting/Finance for Engineers	3	PUBAFRS 5750 Business/Government Relationship	3	ISE 6801 Project Mgmt	3	ENGR 6230 Technology Strategy & Innovation Mgmt	3	ENGR 600X Capstone Project in Operational Excellence for Engineers (Capstone Course)
ENGR 6210 Leadership & Team Effectiveness	3	ISE 5760 Visual Analytics for Sensemaking	3			ENVENG 6600 Assessment for Human Rights	3	
		PUBAFRS 5610 Innovation, Policy & GobaI Economy	3			MBA Operations Management	3	
Total Hours	6		9		3		9	3

Master of Engineering Management (Sample 3 year plan of study)															
Year 1 Autumn		Year 1 Spring		Year 1 Summer		Year 2 Autumn		Year 2 Spring		Year 2 Summer		Year 3 Autumn		Year 3 Spring	
Course	Cr Hrs	Course	Cr Hrs	Course	Cr Hrs	Course	Cr Hrs	Course	Cr Hrs	Course	Cr Hrs	Course	Cr Hrs	Course	Cr Hrs
ENGR 6210 Leadership & Team Effectiveness	3	ENGR 6230 Technology Strategy & Innovation Mgmt	3	ISE 6801 Project Mgmt	3	ENGR 6220 Accounting/Finance for Engineers	3	PUBAFRS 5750 Business/Government Relationship	3			PUBAFRS 5610 Innovation, Policy & Gobal Economy	3	ENGR 6XXX Capstone Project in Operational Excellence for Engineers (Capstone Course)	3
		ISE 5760 Visual Analytics for Sensemaking	3			ENVENG 6600 Assessment for Human Rights	3	ENVENG 5600 Science, Engineering and Public Policy	3						
Total Hours	3		6		3		6		6		0		3		3

Master of Engineering Management (Sample 4 year plan of study)																					
Year 1 Autumn		Year 1 Spring		Year 1 Summer		Year 2 Autumn		Year 2 Spring		Year 2 Summer		Year 3 Autumn		Year 3 Spring		Year 3 Summer		Year 4 Autumn		Year 4 Spring	
Course	Cr Hrs	Course	Cr Hrs	Course	Cr Hrs	Course	Cr Hrs	Course	Cr Hrs	Course	Cr Hrs	Course	Cr Hrs	Course	Cr Hrs	Course	Cr Hrs	Course	Cr Hrs	Course	
ENGR 6210 Leadership & Team Effectiveness	3	ENGR 6230 Technology Strategy & Innovation Mgmt	3	ISE 6801 Project Mgmt	3	ENGR 6220 Accounting/Finance for Engineers	3	PUBAFRS 5750 Business/Government Relationship	3			PUBAFRS 5610 Innovation, Policy & Gobal Economy	3	ISE 5760 Visual Analytics for Sensemaking	3			ENVENG 6600 Assessment for Human Rights	3	ENGR 60XX Capstone Project in Operational Excellence for Engineers (Capstone Course)	3
								ENVENG 5600 Science, Engineering and Public Policy	3												
Total Hours	3		3		3		3		6		0		3		3		3		3		

ENGR 6XXX: Capstone Project in Operational Excellence for Engineers

Course Description

ENGR 6XXX, Capstone Project in Operational Excellence for Engineers is a culminating experience providing students the opportunity to solve real-world challenges by utilizing skills learned from the MEM courses, while implementing the principles of operational excellence and lean systems in an organization. The course will focus on creating learning organizations through problem solving and continuous improvement. This spans every human endeavor and seeks to drive change in the way we work and the way we live. Students will focus on the principles of operational excellence and lean systems as a baseline and explore the detailed workings of processes throughout the enterprise. We will learn how to focus on value and creativity as the engine for change.

We begin with an historical overview and an understanding of lean processes based on Toyota Motor Company's experiences. The heart of the course begins with foundational elements to bring stability to a process, then take steps to achieve higher levels of productivity, profitability, and the professionalism of the workforce. It is not enough to make an organization more efficient; we have to make better places for people to work. As we apply specific lean tools, we will discover their benefits not only to increase productivity, but also to create great workplaces with highly satisfied employees.

Course Objectives

1. Analyze processes to identify problems and develop solutions to improve the performance of those processes.
2. Solve a problem in a work environment.
 - a. Define and document the current situation using value stream map (Concern)
 - b. Analyze a problem to find its root cause (Cause)
 - c. Develop and evaluate multiple countermeasures for the root cause (Countermeasure)
 - d. Plan and implement the best overall countermeasure
 - i. Create flow through a series of processes in a value stream.
 - ii. Regulate the flow of materials or information through a value stream.
 - e. Embed lessons learned into ongoing work practices (Confirm)
3. Model appropriate leadership behaviors to drive changes in the culture of an organization.
4. Build systems to apply and manage lean tools, techniques, principles, and practices in a workplace.

Faculty



David S Veech

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Office: 334 Fisher Hall
Office Phone: 614-292-4730
Office Hours: By appointment

Mr. Veech is a Senior Lecturer in the Department of Management Sciences at the Fisher College of Business, The Ohio State University. Mr. Veech joined the University in 2013 after serving as Executive Director of the Institute for Lean Systems (ILS) for seven years, coaching and consulting with clients in a wide range of industries. His coaching focuses on people in organizations and how lean, leadership, and learning systems contribute to overall employee satisfaction and well-being.

Required Course Materials (Kindle Versions are Acceptable)

1. Lean Lexicon: A graphical glossary for Lean Thinkers, Fifth Edition, Lean Enterprise Institute, ISBN: 978-0966784367
2. The C4 Process (Veech & Damodaraswamy), Robert G. Clark Consulting LLC, ISBN: 978-098326395
3. Change or Die, Alan Deutschman, Collins, 9780061373671
4. Drive, Daniel H. Pink, Riverhead Books, 9781594488849

Grading

This course requires active participation in online activities and exercises as well as reading and assigned work outside of class. Grades will be based on contributions to the discussion and completed weekly assignments, including the primary project assignment (C4 or A3 worksheet showing familiarity of the course contents). The Primary Project is due on .

Participation requires reviewing materials identified, then for each discussion question, you are required to post your own answer based on your research and experience, then engage with at least two of your classmates by commenting on their answers. Consistent contribution through the semester is required., There are a number of activities and assignments that will be used to assess your understanding of the material covered in this course. These are listed below.

Component	Total Course Points
Participation (5 points x 7 discussion questions, 5 points for your completed Carmen Profile, 1 point for each of 6 quizzes, and 4 points for instructor discretion)	50
Bi-weekly projects (4 points x 6 assignments)	24
C4/A3 Project Files (See below)	26
Total (Maximum points)	100

1. Attendance/Participation (50%)

- a. Attendance is required. You should attend every class and participate to:
 - i. Learn as much as possible
 - ii. Achieve a grade you will be satisfied with
 - iii. Know how to apply these principles in a work place
- b. Arrive on time. In class activities will be fast-paced.
- c. Participate. You should share your thinking and observations during every class session. Come prepared to discuss things. Consistent contribution through the semester is much more valuable than a few good days where you answered a couple of questions in class.
- d. Complete an accurate Carmen Profile with a recent picture (4 points)
- e. Complete any assigned reading and knowledge reviews before class.
- f. The final 4 points are at my discretion and are unlikely to be awarded except to truly exceptional contribution, or to prevent catastrophe.

2. Bi-weekly projects/homework (24%)

- a. Bi-weekly assignments are **individual** assignments completed without collaboration among your classmates. You are permitted to assemble a small team in your workplace to execute the assignments, but you must name everyone who

- contributed when submitting.
- b. **Submit on time. Late assignments will not be considered** and your score for that assignment will be zero. No excuses.
 - i. All assignments are due on Thursdays at 6:15 pm. Anything later than that, regardless of the reason, will not count.
 - ii. **ONLY UPLOAD .pdf FILES** for assignments in Carmen. Make sure pages are oriented properly. Only .pdf files will be graded.
 - c. Assignments must be neat and complete, and in the correct sequence. Use relevant pictures and graphs where necessary. Use the templates/forms/supporting materials uploaded on Carmen. Remember; never upload any weekly assignment in any format except a pdf.

3. C4/A3 Project and Presentation (26%)

- a. **Each student must complete an individual project in your company or in your home.** You will use C4/A3 problem solving (details will be provided in class) to address a moderate-scope business problem that involves cost, quality, delivery or a combination of these.
- b. Each student must complete one progress review session with the instructor via skype or zoom in a scheduled meeting. This review is worth 13 percentage points.
- c. Submit a complete C4/A3 worksheet AND a completed Master presentation file (PowerPoint format) that will include primary and supporting analysis for your project. The Final C4/A3 AND presentation file is worth 13 points.

Further details will be available on Carmen

Quizzes and Knowledge Reviews

There will be six knowledge review quizzes that you are required to complete. You may make as many attempts as you need to finish each quiz with a score of 100%

Disability Accommodation

If you need an accommodation based on the impact of a disability, arrange an appointment with me as soon as possible. We need to discuss the course format and explore potential accommodations. I rely on the Office for Disability Services for assistance in verifying need and developing accommodation strategies. You should start the verification process as soon as possible.

Academic Integrity

Material submitted for course grade credit must be your own work. All university and college regulations concerning academic honesty shall apply. In general, students are expected to recognize and uphold standards of intellectual and academic integrity. The university assumes as a minimum standard of conduct in academic matters that students be honest and that they submit for credit only the products of their own efforts. It is particularly important that students read and understand the portions of the Ohio State University's Code of Student Conduct that relate to plagiarism, unauthorized collaboration, falsification, and multiple submissions. The Code of Student Conduct is available online. This Policy represents a core value of the University. All members of the University community are responsible for knowing and abiding by its tenets. Students are expected to carefully review the online Policy prior to undertaking any research or other assignments. Students are encouraged to discuss freely with faculty any questions they may have pertaining to the provisions of the Code prior to submitting assignments. Lack of knowledge of the contents of the University Policy on Academic Honesty is not an acceptable defense to any charge of academic dishonesty.

Schedule (See Carmen for final requirements)

Date	Topic	Activity and Assignment
Session 1	Problem Solving: C4 and A3	<p>Objectives are:</p> <ol style="list-style-type: none"> 1. Apply a problem solving process to solve a work related problem 2. Contrast different problem solving processes and their primary focus 3. Describe key tools to help identify root causes of problems <p>Learning Activities:</p> <ol style="list-style-type: none"> 1. Read: Intro through Chapter 2, The C4 Process 2. Read: Lean Lexicon, A3 Report; PDCA; Problem Solving; Five Whys; Six Sigma 3. View the Problem Solving pdf in Carmen 4. Card Simulation, Round 1, Conventional with small group discussion (Record Stapling Operation) <p>Assignment: Identify the potential problems for your Individual Class Project. Due Date – Online</p>
Session 2	Value Stream Mapping & Analysis	<p>Objectives are:</p> <ol style="list-style-type: none"> 1. Create a current state value stream map to analyze a set of work processes in a theme area. See the system. 2. Calculate takt time 3. Evaluate the customer-supplier relationship in a value stream 4. Analyze processes in a value stream (calculate takt time, processing time, cycle time, set up time, operators and full-time-equivalent people, value-add time, non-value-add time, and any other data required to complete the analysis.) 5. Analyze the flow of materials and information through a value stream <p>Learning Activities:</p> <ol style="list-style-type: none"> 1. Read: Chapter 3, The C4 Process 2. Read: Lean Lexicon: Value Stream Mapping; Pull systems; Cell; Continuous Flow; Cycle Time; Cycle time and related terms involving time; First-in-First-out; Flow production; Heijunka; Heijunka box; Information flow; Inventory; Kanban; Material Flow; Operational Availability versus Operating Rate; Overall Equipment Effectiveness; Product Family; Product Family Matrix; Pull Production; Spaghetti Chart; Supermarket; Takt image; Takt time; Value; Value Stream Manager; Appendix (Value Stream Mapping Icons) 3. Activity: Pencil Pusher Case/Map Card Simulation Current State <p>Assignment: Submit your project current state map to the dropbox for feedback. Due Date Online</p>

Session 3	Visual Organization and Management	<p>Objectives are:</p> <ol style="list-style-type: none"> 1. Apply the principles of 4S/5S in a work setting and describe its utility and value. 2. Analyze a work process using standardized work worksheet sets (Time measurement, Standardized work charts, combination tables, and work balance charts) 3. Describe the relationship between 4S/5S and standardized work <p>Learning Activities:</p> <ol style="list-style-type: none"> 1. Read the attached pdf files on 5S and Standardized Work. 2. Read: Lean Lexicon: Andon; Automatic Line Stop; Dashboard; Error-Proofing; Five Ss; Gemba; Gemba Walk; Genchi Genbutsu; Kamishibai Board; Muda, Mura, Muri; Obeya; Operator Balance Chart; Production Analysis Board; Red Tagging; Right-sized Tools; Standardized Work; Visual Management; Waste; Work; Work Element; Yamazumi Board 3. Activity: Apply 5S/4S to your project problem 4. Activity: Build standardized work for the processes in the Card Simulation <p>Assignment: Submit your standardized work document set (from the team activity we did in class) to the dropbox. Submit the Standardized Work Chart, Time Measurement Sheet, Combination Table, and Work Balance Chart. Due Date online.</p>
Session 4	Lean Overview	<p>Objectives are:</p> <ol style="list-style-type: none"> 1. Differentiate lean systems from mass manufacturing and mass customization 2. Translate the key factors that helped Toyota rebuild itself into key factors organizations can use today to help improve their performance 3. Evaluate the evolution of work systems and their impact on society 4. Create a cause map for a problem <p>Learning Activities:</p> <ol style="list-style-type: none"> 1. Read: pdf on Lean Systems Overview (Carmen) 2. Read: Chapter 4, The C4 Process 3. Read: Lean Lexicon: Basic Stability; Jidoka; Just-in-Time (JIT) Production; Kaizen; Lean Consumption;; Lean Enterprise; Lean Logistics; Lean Management; Lean Management Accounting; Lean Production; Lean Thinking and Practice; Total Productive Maintenance; Toyota Production System; True North 4. Activity: Discussion of Lean Philosophy, the Lean House and Toyota Way principles; Cause Map construction and analysis <p>Assignment: Complete a cause map for your individual</p>

		class project problem and submit to the dropbox. Due Date online
Session 5	Countermeasures	<p>Objectives are:</p> <ol style="list-style-type: none"> 1. Develop a plan to contain the spread of a problem in your workplace 2. Define objective evaluation criteria to use in evaluating the feasibility and potential effectiveness of countermeasures 3. Develop at least 5 alternative countermeasures for every root cause of a problem 4. Create a plan for testing the effectiveness of countermeasures 5. Evaluate countermeasures using multiple criteria to select the best overall option to solve a problem. 6. Plan the implementation of a selected countermeasure. <p>Learning Activities:</p> <ol style="list-style-type: none"> 1. Read: Chapter 5, The C4 Process 2. Read: Lean Lexicon: Coaching; Cross-dock; Downtime; Efficiency; Every Product Every Interval (EPEX); Fixed Position Stop System; Four Ms; Hansei; Heijunka; Heijunka box; Jishuken; Kaikaku; Kaizen Workshop; Kanban; Kata; Material Handling; Milk run; Multimachine Handling; Multiprocess handling; Nemawashi; Paced Withdrawal; Pacemaker Process; Pack-Out Quantity; Pitch; Plan for Every Part (PFEP); Point-of-Use Storage; Preventive Maintenance; Production Preparation Process (3P); Quality Control Circle; Setup Reduction; Single Minute Exchange of Dies (SMED); Trade-off Curves; 3. Read: Attached pdf files 4. Activity: Develop Countermeasures for Card simulation (Focus on stapling) 5. Activity: Run Round 2 and 3 of simulation <p>Assignment: Prepare and complete a 5S/4S activity in your host company. Submit a 3-page summary of the activity (Concern, Cause, Countermeasure, Confirm) with before and after pictures, along with an explanation of the benefits the host company will enjoy as a result of this activity, and explain in detail how the host can sustain the improvement. Due Date online.</p>
Session 6	Leading Change	<p>Objectives are:</p> <ol style="list-style-type: none"> 1. Describe the role of leadership in organizational culture change 2. Create and model key leadership behaviors in a team setting 3. Evaluate the leadership described in class for effective employee engagement and organizational culture changes

		<p>Learning Activities:</p> <ol style="list-style-type: none"> 1. Read: Chapter 7, The C4 Process 2. Read: Lean Lexicon: Change Agent; Chief Engineer; Coaching; Group Leaders; Hansei; Huddles; Jishuken; Leader Standard Work; Lean Promotion Office; Ohno, Taiichi (1912-1990); Plan for Every Person; Sensei; Shingo, Shigeo (1909-1990); Strategy Deployment; Team Leader; Toyoda, Kiichiro (1894-1952); Toyoda, Sakichi (1867-1930); Training Within Industry (TWI); Value Stream Manager; yokoten 3. Read: Attached pdf files 4. Activity: Buffalo Hunter Case Study 5. Lecture/Discussion: Leadership <p>Assignment: Based on your readings and discussions so far this term, prepare and submit a 2-page paper describing how the principles described in class will affect your own leadership style and behavior, including a plan for your personal development. Due Date online.</p>
Session 7	Confirm	<p>Objectives are:</p> <ol style="list-style-type: none"> 1. Implement a solution to a problem. 2. Capture, record, and monitor results from your problem solution. 3. Develop key performance indicators to effectively track and monitor a work process 4. Update standardized work. 5. Train operators to achieve the defined standard for that process as documented in the standardized work 6. Reflect on your experience with the problem solving process and assess future needs of the people participating on the team <p>Learning Activities:</p> <ol style="list-style-type: none"> 1. Read: Chapter 5, The C4 Process 2. Activity: Card Simulation Round 4 3. Activity: Reflection on course activities & contents <p>Assignment: None – Continue working your project</p>
Due Date Online	Final Project Prep and Delivery	<p>Submit your final C4 or A3 worksheet. Due Date Online</p>

Appendix E

Course Descriptions

ENGR 6210 Leadership and Team Effectiveness (3 credits)

Introduction to topics in leadership and team effectiveness with a focus on applications for engineers. Prereq: Grad standing, and enrollment in MGEL degree program; or permission of instructor.

ENGR 6220 Accounting/Finance for Engineers (3 credits)

Provides an overview of the basic topics in financial and managerial accounting. The primary focus will be on helping engineering students understand the meaning of the numbers in financial statements, their relationship to one another, and learning how they are used in planning, decision-making and control towards achieving the objectives of an organization. Prereq: Grad standing, or permission of instructor; and enrollment in MGEL degree program. Not open to students with credit for AcctMIS 5000.

ENGR 6230 Technology Strategy & Innovation Management (3 credits)

How technology strategy may lead to creation/persistence of competitive advantage. In contrast to core strategy course, provides series of strategic frameworks for managing high-tech businesses. Prereq: Grad standing, and enrollment in MGEL degree program; or permission of instructor. Not open to student with credit for BusMHR 7461.

ENGR 7200 Engineering Ethics and Professionalism (1 credit)

To learn professionalism and ethical decision-making strategies; topics include codes of ethics, moral frameworks, engineering as social experimentation, assessment of safety and risk, employer and employee rights and responsibilities, confidentiality and conflict of interest, whistle-blowing, research integrity, consulting engineers, expert witnesses. Engineering ethics case studies in detail

ENVENG 6600 Assessment for Human Rights and Sustainability (3 credits)

Foundational concepts of human rights and environmental impacts pertaining to global supply chains. Regulations and voluntary standards in engineering-intensive sectors, including infrastructure, biofuels, electronics. Case study analysis of corporate assessment practices for labor rights protection and environmental impacts. Prereq: Grad standing, or permission of instructor. Not open to students with credit for 4600.

ENVENG 5600 Science, Engineering and Public Policy (3 credits)

Presents a history of the interactions between science, engineering, and public policy in the United States and in the context of global concerns (e.g. climate change, competitiveness), inquire into how various federal government, universities, & corporations conduct & fund science and engineering & explore how

public sector interests & processes influence sci, engr & public policy. Prereq: Jr, Sr, or Grad standing; or permission of instructor. Cross-listed in PubAfrs.

ISE 6801 Project Management (3 credits)

Provides foundational and advanced project management education in an interactive online learning environment as part of the Master of Global Engineering Leadership program. Prereq: Enrollment in Master of Global Engineering Leadership program, and permission of instructor. Not open to students with credit for 3800.

ISE 5760 Visual Analytics for Sensemaking (3 credits)

Students learn about information visualization techniques that help people analyze massive amounts of digital data to combat overload and aid sensemaking with applications in retail and financial decision making, logistics, information systems, manufacturing, healthcare, energy and smart grids, cybersecurity and social networks. Prereq: Jr, Sr, or Grad standing. Not open to students with credit for 773.01.

ISE 5810 Lean Sigma Foundations (4 credits)

Comprehensive foundation course for the Black Belt Level 'Certificate' (not certification) that is required to complete Green and Black Belt Certification. Prereq: Stat 3470, and permission of instructor. Not open to students with credit for 685.

BUSMHR 7244 Negotiation (3 credits)

Highlight the components of an effective negotiation and teach students to analyze their own behavior in negotiations. Largely experiential, course provides students with an opportunity to develop their skills by participating in negotiations and integrating their experiences with the principles presented in the assigned readings and course discussions. Prereq: Enrollment in Fisher College of Business graduate programs. Not open to students with credit for 7240 or 7241.

MBA 6233 Operations Management (3 credits)

Operations Management (MBA 6233) is designed to provide a solid foundation and deeper understanding of how the operations function contributes to ensuring effective and efficient flow of materials and information within and outside the organization. Prereq: Enrollment in MBA, or permission of instructor. Not open to students with credit for 850.

MBA 6273 Data Analysis for Managers (3 credits)

Introduction to data analysis and statistics for business. Emphasis on achieving an application-oriented understanding of statistical inference and regression analysis and their use in decision making. Prereq: Enrollment in MBA or WPMBA program, or permission of instructor. Not open to students with credit for 6271 or 870.

MBA 6253 Marketing Management (3 credits)

Focuses on the interrelated elements of the marketing mix, its relationship with the other functional areas of management, and marketing responses to the external environment. Prereq: Enrollment in MBA program, or permission of instructor. Not open to students with credit for 840.

PUBAFRS 6050 Management in Public Agencies (4 credits)

Learn to manage public sector organizations with a focus on the external environment: context of public sector organizations, their structure, how they operate; managing organizational performance, innovation, and change. Prereq: Not open to students with credit for 810.

PUBAFRS 6060 Managerial Leadership in Public and Nonprofit Organizations (3 credits)

Managerial Leadership in Public and Nonprofit Organizations with focus on internal operations, processes, and resources; human resource management, information technology; other aspects of internal capacity.

PUBAFRS 5610 Innovation, Policy, and the Global Economy (3 credits)

This course examines frameworks and theories of public administration, governance, and policy for science and engineering at the international level. It will critique existing theories of global knowledge development and transfer, governance, and trade through the lens of science and engineering. Prereq: Jr, Sr or Grad Standing.

PUBAFRS 5750 The Business-Government Relationship (3 credits)

Business tools and strategy for influencing government; evolution and direction of public policy toward business. Prereq: Sr standing and permission of the Associate Director of Academic Affairs and Research. Not open to students with credit for 795.

PUBAFRS 5770 Risk and Decision Analysis in Public Affairs (3 credits)

This course provides a comprehensive assessment of theories and tools for decision-making in the face of risk and uncertainty, giving a rigorous treatment of current issues and approaches in risk analysis through both qualitative and quantitative lenses.

PUBAFRS 6075 Data, Models & Evaluation (3 credits)

This course will provide the knowledge and tools necessary to analyze data. Students learn about fundamentals of statistics to conduct analysis, and they will develop an understanding of program evaluation and research design in order to evaluate the quality of analyses conducted by others and communicate findings. Work on applied project related to their jobs that culminate in Capstone projects.

MEMORANDUM OF UNDERSTANDING

College:	College of Engineering
Department:	Professional and Distance Education Programs
Faculty director:	Dr. Avi Benatar
Primary contact, if different from faculty director:	Bob Mick
Fiscal officer:	Marie Mendenhall-Mead
Marketing director:	Bob Mick
Enrollment contact for state authorization compliance:	Bob Mick
Additional colleges/contacts:	N/A

Name of program:	Master Engineering Management
Approval process (change in delivery or new program):	New Program
Will this program have a different fee structure from what would normally be assessed similar students at the university? If so, then please explain:	Yes, but the fee structure will be the same as the online Master Global Engineering Leadership degree.
Total credit hours:	30
# of courses to be created:	7
# of courses already in an online format that need ODEE review:	0
# of anticipated students:	10-15 - Year 1 15-20 – Year 2 20-30 – each year thereafter



Marketing and Communications:	Having access to marketing resources will allow you to reach large audiences, compete with other online programs, and increase enrollments year-over-year. For this program, does your college plan to do any of the following? Yes/No	
	<i>Conduct advertising specific to this online program -</i>	Yes
	<i>Utilize your college communications team for advertising support</i>	Yes
	<i>Designate marketing responsibilities for this program in an individual's job description (i.e. program director, program coordinator, college communications coordinator, etc.)</i>	Yes MGEL Director Program Coordinator
	<i>Secure an annual marketing budget for online program advertising</i>	Yes, combined with the MGEL degree.
	<i>Host a webpage for your online program on the college's website</i>	Yes
	<i>Utilize your college's admissions/recruitment team to track and communicate with perspective distance students</i>	No. We do our own admission's recruitment because they're separate in the college.



State authorization:	Does this program potentially lead to a professional license or certificate? Yes/No	No
	Is professional licensure a prerequisite for enrollment in the program? Yes/No	No
	For this program, does your college plan to do any of the following outside of Ohio? Yes/No	
	<i>Establish a physical location for students to receive synchronous or asynchronous instruction</i>	No
	<i>Establish an administrative office or provide office space for staff</i>	No
	<i>Conduct on-ground supervised field experiences such as clinicals, practicums, student teaching or internships</i>	No
	<i>Place more than 10 students simultaneously at a single placement site (such as a hospital)</i>	No
	<i>Require students to meet in person for instructional purposes more than twice per semester</i>	No
	<i>Carry out field study or research at a field station</i>	No



Use this table to detail all of the courses associated with the program and when you envision these courses will be developed, delivered, etc. For courses that are already developed and available in an online format, please include them and note development concluded in the Developed column.

Course Name	Faculty Lead	OAA Approved for Online Delivery	Developed	Delivered	5 Hour Review (semester immediately following first delivery)	Reviewed (every 3 years)
Example: Principles of Basic Science	J. Smith	AU16	AU16	SP17	SU17	SU19
ISE 5760 Visual Analytics for Sensemaking	Michael Rayo		SP20 New Course to be developed	SP21		
PUBAFRS 5610 Innovation, Policy, and the Global Economy	To be assigned by JGCPA		SP20 New course to be developed	SP21		
MBA 6233 Operations Management	To be assigned by FCOB at a future date		AU20 New course to be developed	AU21		
ENGR 6XXX Capstone Project in Operational Excellence for Engineers	David Veech	No	SP20 New course to be developed	SP21		
ENGR6210 Leadership and Team Effectiveness	Jeff Ford		SP14	AU14		AU17
ENGR 6220 Accounting/finance for Engineers	Marc Smith		SP14	AU14		
ENGR 6230 Technology Strategy & Innovation Management	Michael Leiblein		SP15	SP16		
ISE 6801 Project Management	Jack Slavinski		SP15	SU15		
PUBAFRS 6050 Management in Public Agencies	Rudolph Hightower		SU15	AU15		
PUBAFRS 6060 Managerial Leadership in Public & Nonprofit Organizations	To be assigned by JGCPA		This course will be developed as part of an online program by JGCPA			
ENGR 7200 Engineering Ethics and Professionalism	Richard Higgins		SU14	SU15		SU17
ISE 5810 Lean Sigma Foundations	To be assigned by the ISE dept in COE		The ISE dept has not had an instructor available for this course.			
ENVENG 6600 Assessment for Human Rights and Sustainability	Allison McKay		SP16	SP17		
ENVENG 5600 Science, Engineering and Public Policy	Jeff Bielicki		SP16	SP17		
PUBAFRS 5750 The Business-Government Relationship	Kim Young		SP14	SP15		
PUBAFRS 5770 Risk and Decision Analysis in Public Affairs	To be assigned by JGCPA		This course will be developed as part of an online program by JGCPA			
PUBAFRS 6075 Data, Models & Evaluation	To be assigned by JGCPA		This course will be developed as part of an online program by JGCPA			
BUSMHR 7244 Negotiation	To be assigned by FCOB at a future date		This will be an elective course & will be developed at a future date – likely in 2021 or later.			



MBA 6273 Data Analysis for Managers	To be assigned by FCOB at a future date		This will be an elective course & will be developed at a future date – likely in 2021 or later			
MBA 6253 Marketing Management	To be assigned by FCOB at a future date		This will be an elective course & will be developed at a future date – likely in 2021 or later			



Colleges entering into this agreement will:
Secure approval from the following, where applicable: <ul style="list-style-type: none"> • Graduate School • Council on Academic Affairs (CAA) • University Senate • Board of Trustees • Department of Higher Education
Contact the university budget office regarding new program and to request a distance-education-specific fee table. Differential fees must be approved by the Board of Trustees, if applicable.
Meet the program standards set forth by your accrediting body (if applicable) for alternative delivery models
Submit courses for online delivery and any course revisions to curriculum.osu.edu (after CAA approval)
Label students in Student Information System with appropriate subplan. Distance students = subplan ONL
Provide budget forecasting/market analysis using ODEE funding model (attached) <ul style="list-style-type: none"> • Incur the costs for your program specific advertising • Incur additional costs associated with distance education programming (e.g. student advising, increased TA support)
Collaborate with ODEE on state authorizations and state licensure approvals, if applicable <ul style="list-style-type: none"> • Upon request, provide program and faculty information to the state authorization team • Provide required professional licensure board disclosures to potential and enrolled students in writing • Communicate to prospective students their ability to enroll and seek federal financial aid based on state authorizations • Notify ODEE of states/countries where they would like to enroll students • For licensure programs, post a link to the Ohio State Online disclosures page (online.osu.edu/state-authorization/disclosures) on the College program page • Encourage distance education faculty/instructors/students to participate in ODEE distance education training <ul style="list-style-type: none"> ◦ "State Authorization 101" BuckeyeLearn course
Collaborate with ODEE on the technical solutions for effective course delivery: <ul style="list-style-type: none"> • Online-specific syllabus requirements (e.g., ADA statement, Academic Integrity/Academic Misconduct statement) • Ohio State identity/branding guidelines • Carmen course template providing students with effective navigation and online course expectations, etc. • Provide course content materials for placement into mutually agreed upon formats and technologies for distance delivery • Utilize Quality Matters principles in course design • Focus on outcome-based learning and incorporate assessment into courses
Collaborate with ODEE Instructional Designers to infuse academic integrity best practices into program course development and delivery, including, but not limited to, authentic assessments and online proctoring of examinations.
Encourage distance education faculty/instructors to participate in professional development opportunities, including ODEE's Distance Education Learning and Teaching Academy
Collaborate with relevant student support services (Disability Services, Writing Center, Libraries, Veterans Affairs, etc.) <ul style="list-style-type: none"> • Incur costs to provide required accessibility accommodations for videos and activities not produced by ODEE
Collaborate with ODEE to review and update courses immediately following first delivery and every three years.
Provide at least one required student participation activity per week in each course



- Course designers will implement activities each week of a course to verify enrollment. This is beyond a simple login to a course space, but constitutes a discussion posting, quiz attempt, artifact submission, etc.

Identify student technology support for tools only used by your program.




Provide replacement instructor(s) in a timely manner should an instructor separate from the university during the course development process or terminate and postpone course development until a replacement instructor can be identified.



ODEE entering into this agreement will:
<p>Administer state authorization program</p> <ul style="list-style-type: none"> Necessary to ensure program meets federal student financial aid guidelines Communicate with the colleges the status of approved state authorizations
<p>Collaborate with the college on the technical solutions for effective course delivery:</p> <ul style="list-style-type: none"> Online-specific syllabus requirements (e.g., ADA statement, Academic Integrity/Academic Misconduct statement) Ohio State identity guidelines Course templates providing students with effective navigation and online course expectations, etc. Placing course content materials into mutually agreed upon formats and technologies for distance delivery Utilize Quality Matters principles in course design Focus on outcome-based learning and incorporate assessment into courses
<p>Collaborate with program faculty and staff to infuse academic integrity best practices into program course development and delivery, including, but not limited to, authentic assessments and online proctoring of examinations.</p>
<p>Provide instructional designer production time during the course development cycle, including the 14-week development process, five-hour review and three-year revision.</p>
<p>Provide distance education professional development opportunities for faculty/instructors/students through ODEE's Distance Education Learning and Teaching Academy</p>
<p>Collaborate with the college to review and update courses immediately following first delivery and every three years</p>
<p>Collaborate with course instructors to provide at least one required student participation activity each week in a course</p> <ul style="list-style-type: none"> Course designers will implement activities each week of a course to verify enrollment. This is beyond a simple login to a course space, but constitutes a discussion posting, quiz attempt, artifact submission, etc.
<p>Provide distance education faculty and students access to:</p> <ul style="list-style-type: none"> An OCIO-managed, 24/7, Tier 1 help desk for ODEE/OCIO provided tools/services
<p>Provide Ohio State Online program advertising</p> <ul style="list-style-type: none"> Two-minute, program-specific introductory video Consult with college marketing on strategies for program-specific advertising Program included in general Ohio State Online marketing strategy Marketing will only be conducted in states/countries in which the program has been authorized
<p>Collaborate with program directors to revise the course development process should an instructor separate from the university during that time. Options include continue work on course through the end of the 14-week development process with a replacement instructor or terminate and postpone course development until a replacement instructor can be identified.</p>

Please note: each service-level agreement will dictate the ODEE products and services utilized



MOU created by:	Bob Mick and Jennifer Simmons	
	Mike Hofherr, Vice President and Chief Information Officer: 	Date: 11.8.2018
	David Williams, Dean, College of Engineering: DocuSigned by:  49EB1CD8B5A8459	Date: 11/7/2018
	Marie Mendenhall-Mead, Chief of Staff & Executive Director of Finance, College of Engineering: DocuSigned by:  080GAE26E1GF4B5	Date: 11/7/2018

**Please review and attach program revenue projection worksheet.*

PROGRAM REVENUE PROJECTION

Approved by:	College Fiscal Officer:	Date:



THE OHIO STATE UNIVERSITY

Office of Distance Education and eLearning

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