Master of Engineering Joint Review

May 2009

Supporting Documentation

1. April 17, 2009 final report of the committee conducting the joint review follow-up. (A draft of this report was circulated to the committee for comment on January 30, 2009)

2. “Program Evaluation Criteria, Master of Engineering Oversight Committee”. January 28, 2009. This document was compiled by the M.Engr. Oversight Committee in response to requests made by the review committee at the December 4, 2008 review committee meeting.

3. Charge to the review committee, October 21, 2008


5. September 12, 2007 Farrell to Peercy memo requesting the follow up joint review.

6. May 12, 2005 Singer to Spear memo accepting the joint review committee report.

7. April 28, 2005 Spear to Singer memo reporting the joint review committee report.

8. February 14, 2005 report of the 2005 joint review committee

9. May 2004 Master of Engineering self study

10. November 13, 2004 Supplemental material provided to the review committee

April 17, 2009

TO: Julie Underwood, Interim Provost

From: Jocelyn Milner, Director, Academic Planning and Analysis

SUBJ: Joint Review Follow-up of the Master of Engineering

Copies: Daniel Schaefer, professor and chair of Animals Sciences (UAPC representative)
Jake Blanchard, professor of Engineering Physics (representative of the program)
Parameswaran (Parmesh) Ramanathan, professor and chair of Electrical and Computer Engineering (GFEC representative)
Carmen Faymonville, academic planner (representative of UW System Academic Affairs)
Judith Kornblatt, associate dean, Graduate School
Terry Millar, associate dean, Graduate School
Steve Cramer, associate dean, College of Engineering
Paul Peercy, dean, College of Engineering

The committee charged with the follow-up to the joint review for the Master of Engineering (MEngr) met on December 4, 2008. Jake Blanchard, Parmesh Ramanathan, Dan Schaefer, and Carmen Faymonville were present with me at that meeting. Some additional information was exchanged via email and some phone conversations. A draft version of this report, which included additional information provided by Jake Blanchard, was circulated to the review committee on January 30, 2009. At that time all of the UW-Madison members endorsed the proposal with minor changes. However, Dr. Faymonville has some additional questions and comments and she has not yet endorsed this report. Because the System guidelines for joint reviews allow us to proceed without the explicit endorsement of the System representative at this stage, we are submitting this report in time for the committee’s work to be completed this academic year. Dr. Faymonville’s participation is important to us and her comments and those of our System colleagues will be considered at a later stage in the process.

Background

The MEngr was implemented in 1998. The MEngr was approved as a structure in which a number of options would be unified under the umbrella degree program. The idea was that this structure would allow for flexibility and experimentation in practice-oriented masters-level education and for a more rapid response to changing industry needs.

The 2005 joint review examined both the oversight structure and the individual program options. The review committee found that, for the most part, individual program options have made
commendable progress and developed a strong academic foundation. However, the review committee found that the oversight structure that was originally proposed had not been established. The review committee deemed the implementation of this oversight structure to be essential to the ongoing success of all program options operating within the MEng program structure. The 2005 joint review requested a follow-up review to verify that the oversight committee had been established and was focusing on a uniform standard of program quality across the options. The 2005 joint review committee identified six specific questions that were the focus of this 2008 joint review committee.

1. What structure has been established to oversee the creation and management of all of the MEng program options, as described in the planning documents? What evidence has been provided to show that this structure is actively ensuring quality within and across all MEng offerings?

2. What are the assessment criteria for the program options? Assessment should address practices for evaluating and continuously improving courses with each option and the curriculum, instructional design, and student support of each option.

3. What are the criteria for determining whether an option needs to be modified in light of changes in the instructional staff and external environment?

4. What are the criteria for determining whether to approve additional Master of Engineering program options or to discontinue a current option?

5. What are the criteria to detect whether an MEng option has slipped or shifted from its intended purpose?

6. What has been done about the vulnerability of the MEng-Technical Japanese?

**Information Used in this Review**

The review was based on documents from the 2005 joint review committee, a Fall 2008 status report from the MEng Oversight Committee, additional information provided verbally by Jake Blanchard at the review committee meeting, and information posted at the MEng Oversight Committee web site (http://meoversight. engr.wisc.edu/).

In addition, at the close of the 12/4/2008 review committee meeting, the review committee requested that MEng Oversight Committee provide the review committee with an additional document that provided the criteria requested by questions 2, 3, 4 and 5.

That document “Program Evaluation Criteria, Master of Engineering Oversight Committee”, was provided on January 28, 2009. It is attached to this report. It includes guidelines for program assessment, criteria for new programs, and criteria for terminating programs. It is structured in a way that will assure it will be useful to the MEng Oversight Committee and the individual MEng programs and their faculty to guide attention to the expectations for program quality.

**Findings**

The findings of this review committee are organized under the six questions posed by the 2005 committee.
1. What structure has been established to oversee the creation and management of all of the Master of Engineering program options, as described in the planning documents? What evidence has been provided to show that this structure is actively ensuring quality within and across all MEngr offerings?

The MEngr Oversight Committee was charged by the associate dean of academic affairs of the College of Engineering in fall 2007 and the structure of this standing committee was endorsed by the CoE Academic Planning Council (chaired by the dean).

MEngr Oversight Committee was charged to oversee the creation and management of MEngr programs and to actively ensure quality within and across all MEngr offerings. Members serve a three year term with a phased turn over of membership. The committee is to meet more than once a year, and as needed and to provide a report to the Dean of Engineering by May 30 of each year. The six-member committee includes program faculty; the associate dean for academic affairs serves as an ex officio member.

The MEngr Oversight Committee met several times in 2007-08 and reviewed each of the five program options within the degree structure. They identified several program strengths and weaknesses and issues that need to be addressed going forward and delivered a written report on the findings. The oversight committee established a web site to communicate, document, and archive records of the committee’s activity.

Review committee members questioned the commitment of CoE to the MEngr Oversight Committee given that it had taken so long to get it established after the program was originally implemented. Evidence that CoE’s commitment is now strong is that the oversight committee has been established as a standing committee in CoE. MEngr Oversight Committee has demonstrated to CoE the need for this group to be active by its work in the first year and the long list of issues that need attention (see the Fall 2008 status report). Several changes have been made in response to the work of the oversight committee. There is a recognition that the faculty who lead the specific program options need to better understand the nature of the program and their responsibilities for a standard of practice and program quality. After one year of operation the MEngr Oversight Committee has established a foundation of knowledge about the individual programs and is set to focus on addressing issues identified in the first year. In response to a request by this review committee, the MEngr Oversight Committee was able to make explicit criteria for evaluating program quality in only about six weeks (attached).

2. What are the assessment criteria for the program options? Assessment should address practices for evaluating and continuously improving courses with each option and the curriculum, instructional design, and student support of each option.

The MEngr-Professional Practice (MEPP) was identified in the 2005 review as providing a model for assessment for all of the options. In fact, the 2005 review report notes that program is recognized as a national model. Similarly, MEngr – Engine Systems (MEES) has good systems in place to evaluate student learning and program quality. MEPP has stated goals or expectations for students who complete the program. MEPP’s assessment methods include end-of-semester evaluations of learning in courses by both students and instructors; a detailed programmatic
evaluation by students at graduation; and a program impact survey conducted about a year after graduation that goes to graduates, their employment supervisor, and their families. The information gathered using these assessment tools is used as evidence in deciding which curricular and program elements are effective and which need improvement.

The MEngr Oversight Committee has now developed explicit “Program Evaluation Criteria”, which includes guidelines for each program to follow for program assessment.

3. What are the criteria for determining whether an option needs to be modified in light of changes in the instructional staff and external environment? AND 5. What are the criteria to detect whether an MEngr option has slipped or shifted from its intended purpose?

Questions 3 and 5 focus on criteria for evaluating if the program can and does meet the original intentions. Our responses to these questions are overlapping. The 2008 report from the MEngr Oversight Committee illustrated several ways in which the options are evaluated in light of changes in instructional staff, external interest or need, and the way in which the curriculum has developed.

For example, questions like the following were part of the 2007-08 review process:
- are the qualifications of applicants being evaluated in admissions practices consistent with the expectations specified for the MEngr? (For example: Does the applicant have an engineering degree? Does the applicant meet required years of work experience? Does the applicant meet minimum academic qualifications?)
- does the structure of the option curriculum meet the MEngr guidelines (per original proposal or as subsequently revised by the MEngr Oversight Committee)
- does the option have sufficient enrollment and student interest?
- does the option have sufficient instructional contributions from participating faculty?
- because these are intended to be practice-oriented options, are there sufficient demand and employment opportunities for graduates?

As noted above, the MEngr Oversight Committee has now developed explicit “Program Evaluation Criteria”, which is a basis for judging if programs are meeting their goals and the needs of students.

4. What are the criteria for determining whether to approve additional Master of Engineering program options or to discontinue a current option?

Although new options have not been proposed since the MEngr Oversight Committee was established, the 2007-08 review of all of the MEngr options by the oversight committee illustrated several criteria that are implicit in the decision to continue a program, and conversely, these criteria would apply to considerations for new options. Among them are:
- is there a demand in industry sectors and among employers for the option?
- is there sufficient enrollment and student interest?
- does the option have commitment for participation by faculty and instructors?
- are admissions standards and the curriculum consistent with the overall structure of the MEngr?
- are there sufficient instructional resources to support the program?
- is there sufficient administrative support for the program?
- is there a plan for evaluating student learning and program quality?

These criteria and others are now documented in the “Program Evaluation Criteria”, which includes sections that explicitly address approval of new options and termination of options.

6. What has been done about the vulnerability of the MEngr-Technical Japanese?

The 2005 review committee observed that a program with one faculty member leaves students in a vulnerable position if the faculty member becomes unable to teach or chooses to leave the program. In addition, students are exposed to only one instructor’s view points. That this arrangement needs attention is obvious to all the reviewers and concerns are widely shared in CoE and among the MEngr Oversight Committee. Despite these concerns, the oversight committee judges that this is a successful program for a small and targeted audience: it meets an important and growing need for engineers to be able to communicate with Asian audiences. The MEngr Oversight Committee has had the Technical Japanese program develop a plan to continue the program and serve in-course students with other qualified instructors who are available at UW-Madison should the faculty member become unable to teach. The MEngr Oversight Committee recognizes the need to monitor these issues for this program on an on-going basis.

Conclusion

This review committee finds that the MEngr Oversight Committee has been established and is now institutionalized by the College of Engineering. It has begun a regular cycle of review of the options within the program and has established reference criteria for program quality.

This joint review committee recommends that the joint review be considered completed and that the program be continued.

Attachments

1. “Program Evaluation Criteria, Master of Engineering Oversight Committee”
2. Fall 2008 Status Report
3. Charge to this committee
4. Report from the 2005 Joint Review Committee
Program Evaluation Criteria
Master of Engineering Oversight Committee

Program Assessment
Every program must define and implement a program assessment plan. This plan should include most or all of the following elements:

- Articulation of program goals
- An assessment of every course each semester the course is offered. This assessment can use the evaluation instruments used in other engineering courses, or it can use an instrument designed specifically for that course.
- Tracking of student employer and position upon graduation to assess employability of graduates
- Program evaluation by students as they graduate (via exit interviews or online surveys). Evaluation should assess, at a minimum, program curriculum, program format, student support, and recommended improvements
- Program evaluation by recent graduates (3 or more years past graduation) to assess impact upon abilities and career development
- Program evaluation by employers of graduates
- Program evaluation by outside parties (e.g., advisory committee, invited academic/industry reviewers, accrediting organizations)
- A description of how findings are reviewed and the process for making evidence-based changes to the program

Results of program assessment efforts shall be reported to the Master of Engineering Oversight Committee annually no later than September 1 for the preceding academic year.
Criteria for Approval of New Master of Engineering Programs

In order to be approved, a proposal for a new Master of Engineering program must:

- Present a curriculum which satisfies the ME template
- Present a viable business plan with budgets for program development and annual operations. Budgets should address types and amounts of expenditures and revenues
- Demonstrate market viability of the proposed program. Viability of the program’s curriculum, design and pricing should be validated via a formal market survey. Identify targets and minimum requirements for annual admissions, and extent to which students are expected to be self-supporting or employer-funded. Compare proposed program with current/pending competing programs.
- Outline marketing plan. Address the methods (e.g., print, web, open houses) and infrastructure that will be used to promote the program to prospective students and their employers. Identify strategies for following up with interested parties to increase applications from qualified students.
- Present a plan for managing and administering the program, identifying key staff and infrastructure requirements.
- Present a plan for student services including: recruiting, admissions, advising, academic support, library services, and instructional technology support.
- Demonstrate adequate faculty participation and interest.
- Present a program assessment plan.

Criteria for Terminating Master of Engineering Programs

Occasionally we will want to terminate Master of Engineering programs. There are costs associated with keeping a program alive and those costs may outweigh the program benefits if it there is not sufficient activity. The criteria for making such a decision are as follows:

- Is the number of enrolled students sufficient to sustain program?
- Is there adequate faculty involvement?
- Is the program generating adequate revenue relative to its costs?
- Are graduates finding jobs in the field or continuing their education?
- Are students graduating in a timely manner?

Programs unable to cover costs for two consecutive years or otherwise deemed to be seriously deficient should prepare a plan to correct the deficiency or should prepare a plan to terminate the program while completing commitments to currently enrolled students.
October 21, 2008

TO: Jocelyn Milner, Director of Academic Planning and Analysis, (chair)
Daniel Schaefer, Professor and Chair of Animals Sciences (UAPC representative)
James (Jake) Blanchard, Professor of Engineering Physics (representative of the program)
Parameswaran (Parmesh) Ramanathan, Professor and Chair of Electrical and Computer Engineering (GFEC representative)
Janice Sheppard, Academic Planner (representative of UW System Academic Affairs)

FROM: Patrick V. Farrell, Provost

SUBJ: Charge to the Follow-up Joint Review Committee for the Master of Engineering

Thank you for agreeing to serve on the follow-up joint review committee for the Master of Engineering (M.Engr). This program was implemented in 1998 and underwent a joint review in 2004-05. The joint review committee requested that there be a follow-up review focused on a few specific points as outlined below. (The term “joint review” means that the review is conducted jointly between UW-Madison and UW System Administration.)

Jocelyn Milner will chair the committee: she will contact you to schedule a meeting, assist you if you need additional information, and take leadership on preparing a short written report. Jake Blanchard will represent the program faculty. Parmesh Ramanathan will represent the Graduate Faculty Executive Committee. Daniel Schaefer will represent the University Academic Planning Council. Janice Sheppard will represent the UW-System Office of Academic Affairs. The composition of joint committees is guided by UW System and UW-Madison joint review policy and this membership structure is consistent with those guidelines.

I ask that you conduct this review and send me your report by December 19, 2008.

The M.Engr. was designed and implemented to be an umbrella degree program for a series of related M.Engr. program options. Consequently, the 2005 joint review examined both the oversight structure and of the individual program options. The review committee found that, for the most part, individual program options have made commendable progress and developed a strong academic foundation. However, the review committee found that the oversight structure that was originally proposed had not been established. The review committee deemed the implementation of this oversight structure to be essential to the ongoing success of all program options operating within the M.Engr. degree structure. The 2005 joint review requested a follow-up review to focus narrowly on the following six questions:

1. What structure has been established to oversee the creation and management of all of the Master of Engineering program options, as described in the planning documents? What
evidence has been provided to show that this structure is actively ensuring quality within and across all M.Engr. offerings?

2. What are the assessment criteria for the program options? Assessment should address practices for evaluating and continuously improving courses with each option and the curriculum, instructional design, and student support of each option.

3. What are the criteria for determining whether an option needs to be modified in light of changes in the instructional staff and external environment?

4. What are the criteria for determining whether to approve additional Master of Engineering program options or to discontinue a current option?

5. What are the criteria to detect whether an M.Engr. option has slipped or shifted from its intended purpose?

6. What has been done about the vulnerability of the M.Engr.-Technical Japanese?

The purpose of this follow-up review is to complete the work of the 2005 joint review by addressing these questions and to determine if the oversight structure is institutionalized. You do not need to repeat the other work of the 2005 joint review committee that focused on the individual program options. Please include in your report an explicit recommendation on whether or not the program should be continued. You are welcome to provide the M.Engr. program with any other advice that may be helpful.

Several documents that serve as the basis for your review are attached.

1. September 23, 2008 Cramer to Farrell memo and Status Report
2. September 12, 2007 Farrell to Peercy memo requesting the follow-up joint review
3. May 12, 2005 Singer to Spear memo accepting the joint review committee report
4. April 28, 2005 Spear to Singer memo reporting on the joint review committee report
5. February 14, 2005 Report of the 2005 joint review committee
6. May 2004 Self-Study
7. Program proposal summary from 1998

Typically, review committees meet once or twice to review the materials and any additional material you may request. After you complete your review, please prepare a short report (2-5 pages) and send it to me by December 19, 2008. After I receive your report, the GFEC and the UAPC will consider it, and I will forward my recommendation regarding continuation of the program along with supporting documents to UW System Administration for final consideration.

Again, I very much appreciate your willingness to accept this assignment.

Attachments

xc:  Paul Peercy, Dean, College of Engineering
     Steve Cramer, Associate Dean, College of Engineering
September 23, 2008

TO: Patrick Farrell, Provost and Vice Chancellor

FROM: Steve Cramer, Assoc. Dean of Academic Affairs

Re: Masters of Engineering Degree Programs

I am responding to your memo to Dean Peercy of Sept. 12, 2007 regarding the College of Engineering’s Master of Engineering Degree programs. A joint review of these programs was suspended in 2004-05 pending the formation of internal college of Engineering Review Committee. The joint review once reactivated will focus on the following six questions:

1. What structure has been established to “oversee the creation and management of each of the Master of Engineering programs” per the authorization of the ME degree? What evidence has been provided to show that this structure is actively ensuring quality within and across all Master of Engineering offerings?
2. What are the assessment criteria for the degree programs? Assessment should address practices for evaluating and continuously improving: (1) individual courses with each program; and (2) the curriculum, instructional design, and student support of each degree program.
3. What are the criteria for determining whether a degree program needs to be modified in light of changes in the instructional staff and external environment?
4. What are the criteria for determining whether to approve additional Master of Engineering degree programs or to discontinue a current program?
5. What are the criteria to detect whether a degree program has slipped or shifted from its intended purpose?
6. What has been done about the vulnerability of the Master of Engineering – Technical Japanese program?

This memo provides a report on resolving these issues by which the joint review can be reactivated. In the fall of 2007, the College of Engineering Master of Engineering Oversight Committee was formed with the charge to oversee the creation and management of CoE Master of Engineering programs and to actively ensure quality within and across all Master of Engineering offerings and the requirement to report to Dean and the Academic Planning Council in May of each year. The committee consisted of professors Larry Bank (resigned Feb 2008), Jake Blanchard, Chair, Wayne P. Pferdehirt, Chris Rutland, Barry Van Veen, Steve Cramer (ex officio).

The committee met frequently during 2007 and early 2008. Members collected data, interviewed degree program representatives and reviewed each of five existing ME degree programs. A summary of their report was presented to the College of Engineering Academic Planning Council on May 7th and accepted by the APC. The complete report is attached. The committee focused in 2007-08 on assessing program viability and program quality. The criteria used by the committee in evaluating each program included:

- Do the degree requirements meet the stated requirements of the Master of Engineering degree authorization from 1998?
• Does the program have a student enrollment and demand that renders the program viable?
• Does the program maintain quality through a selective admissions process, course offerings of comparable quality to other graduate course offerings in the college and the university?
• Is the program effectively administered?
• Does the program have a source of faculty to ensure the continuity and success of the program?
• Does the program show continuous improvement?

These criteria were compared with program data and interview responses leading to the conclusions presented in the attached report. No new degree programs are currently under consideration and some of the existing degree programs are still in the development stage. I expect the oversight committee will continue to refine its process and evaluation criteria as it continues to meet during academic year 08-09 and engages in the completion of the joint review. Let me know if you have any questions.

cc: Dean Paul Peercy
    Prof. James Blanchard

Encl.
Status Report
Master of Engineering Oversight Committee
Fall 2008

Background

The Master of Engineering degree at the University of Wisconsin – Madison was created in 1998. The degree requirements are as follows:

- Students must take a minimum of 24 credits, with at least 12 being taken in the College of Engineering
- No more than 12 credits can be transferred from other universities or colleges
- At least 9 credits must be at or above the 500-level
- Students lacking appropriate work experience in their chosen field must include at least 6 credits of engineering professional practice. In most cases, these credits will consist of projects carried out in conjunction with practicing engineers.

Programs can be added within this umbrella via approval by the College Academic Planning Council. There currently are 5 Master of Engineering programs:

1. Master of Engineering in Polymer Engineering and Science (introduced in 1998)
2. Master of Engineering in Professional Practice (introduced in 1998)

 Oversight

The Master of Engineering Oversight Committee is charged with oversight of the creation, management, and quality assurance associated these degree programs. This Committee fulfills the requirement in the March 1998 degree authorization that the College establish a committee to approve and oversee Master of Engineering degree options. The absence of such a Committee within the College was noted in the 5-Year review of the ME degree program by the Provost’s Office initiated in 2003 and the current Committee was initiated in 2007 to address this requirement and need. The intent is for the current committee to be a standing committee, meeting regularly to provide ongoing assessment of the status of the Master of Engineering degree programs. The committee currently consists of

- James Blanchard, Engineering Physics (Chair)
- Chris Rutland, Mechanical Engineering
• Barry van Veen, Electrical and Computer Engineering
• Wayne Pferdehirt, Engineering Professional Development
• Larry Bank, Civil and Environmental Engineering (resigned from the committee in Feb 2008)
• Steve Cramer, Associate Dean (ex oficio)

The committee met with representatives of each of the Master of Engineering programs to receive a status report on their respective programs. Our findings are provided below, along with a set of recommendations. The primary issues we addressed relate to the long-term viability of the programs and the assurance of their quality.

Program Summaries

The Master of Engineering in Technical Japanese (METJ) provides students with the advanced skills and knowledge that are necessary to interact effectively with Japanese counterparts in the technical or business arena. Courses focus on language instruction at the basic or intermediate level and current problems, activities and accomplishments in the spheres of Japanese economic activity and Japanese technological progress at the advanced level. The program is run by Jim Davis from EPD, is administered by EPD, and has graduated 21 students since it began in 1999. There currently are an additional 19 students actively pursuing an METJ degree. The curriculum (http://metj.engr.wisc.edu/) for the program is as follows:

• EPD 330 Basic Technical Japanese I 3 cr.
• EPD 332 Basic Technical Japanese II 3 cr.
• EPD 374 Intermediate Technical Japanese I 3 cr.
• EPD 375 Intermediate Technical Japanese II 3 cr.
• EPD 430 Japanese for Business and Industry 3 cr.
• EPD 530 Advanced Technical Japanese Seminar 3 cr.
• EPD 630 Research in Japanese Technical Literature* 3 cr.
• EPD 630 Research in Japanese Technical Literature* 3 cr.

We had two concerns with respect to this program. First, Davis teaches all the courses, so it is at risk if, for some reason, he is unable to teach. Such high reliance on a single faculty member is also an academic concern with respect to the exposure of students and instructors to multiple perspectives. Davis shared with us a backup plan in case there is a change in his ability to teach, but it involves faculty from other departments and former students not currently affiliated with the UW. The second weakness is with respect to admissions requirements. Davis stated that admission requires a BS or BA in any field, but we are of the opinion that, as a Master of Engineering, the degree should require a BS in engineering or a related field.
The Master of Engineering in Professional Practice (MEPP) is designed to provide mid-career engineers with the skills, tools, and insights needed to be more effective as technical leaders of engineering projects and organizations. The degree program serves engineers from all disciplines and provides an effective alternative to an MBA or discipline-specific M.S. The program Director is Wayne Pferdehirt and is administered through EPD. MEPP has graduated 190 students between 1998 and 2007. There are currently 56 students in the program. The curriculum is as follows (http://mepp.engr.wisc.edu/):

- Network Skills for Remote Learners (1 credit)
- Summer Residency late August, on campus
- Technical Project Management (3 credits)
- Engineering Economic Analysis and Management (3 credits)
- Communicating Technical Information (3 credits)
- Engineering Problem Solving with Computers (3 credits)
- Independent Reading and Research in Applied Engineering (1 credit)
- Summer Residency; late August, on campus
- International Engineering Strategies and Operations (3 credits)
- Engineering Applications of Statistics (3 credits)
- Quality Engineering and Quality Management (3 credits)
- Engineering Business Data Communications (3 credits)

We identified no weaknesses in this program.

The Master of Engineering in Engine Systems (MEES) is targeted at working engineers in the automobile and internal combustion engine industries. The degree focuses on technical integration of the disciplines required in the design and development of internal combustion engines and vehicle powertrain systems. As such it emphasizes breadth within a specific industry, in contrast with the research depth of an on-campus Master of Science degree. The program is run by Sandra Ashford in EPD and is administered by EPD. The program has graduated 10 students since it began in 2003 and there currently are 37 students enrolled. The curriculum is as follows (http://mees.engr.wisc.edu/):

- Network Skills for Remote Learners (1 credit)
- Thermal Systems Engineering (3 credits)
- Engine Performance and Combustion (3 credits)
- Engine Fluid Dynamics (3 credits)
- Engine Systems and Controls (3 credits)
- Perspectives in Engine Modeling (3 credits)
- Engine Project Management (3 credits)
- Analysis of Trends in Engines (3 credits)
- Engine Application Project (3 credits)
- Engine Design (3 credits)
The only identified weakness associated with MEES is the difficulty the program has had reaching its enrollment goals. Given its specific focus on the internal combustion engine industry, MEES draws from a comparatively limited audience. It remains to be seen whether recruitment to MEES can sustained at the level necessary for financial viability. The committee also had minor concerns regarding admissions requirements for this program.

The Master of Engineering in Polymer Engineering and Science (MEPES) prepares engineers and scientists for professional practice in the polymer industry. The degree draws on the interdisciplinary nature of design, processing, and manufacturing with polymers. Graduates are typically employed by the plastics industry or by other polymer manufacturing businesses. This is the first graduate degree labeled Polymer Engineering and Science in the Big Ten. The program is run by Tom Turng and is administered within the Mechanical Engineering department. The program has graduated 10 students since it began in 1998 and there currently are 9 students enrolled. The curriculum is as follows (http://rrc.engr.wisc.edu/PolEngSci.html):

- Students apply to the Mechanical Engineering department
- 24 credits of polymer science courses are required
- At least 18 credits must be formal lecture or laboratory courses
- At least 6 credits must be from courses numbered 600 or higher
- At least 3 credits must be from courses numbered 700 or higher
- No more than 6 credits of independent study are allowed.
- Students are required to take 2 credits of seminar (ME/ChE/EMA 925). They will earn 1 credit for each semester they complete.
- No transfer credits are allowed.

We identified two weaknesses in this program. First, the curriculum does not explicitly require professional practice. Most students do satisfy the requirements, either through previous work experience or projects with industry, but it isn’t clear there is a mechanism to ensure that all students satisfy the requirement. Second, there is a feeling among the faculty involved that some students who are in the program receive an MS, rather than an ME, degree. This should be monitored more carefully by the program administrators and the distinction between the MS and ME programs should be made clear to the faculty and students involved.

The Master of Engineering in Energy Systems trains engineers and scientists who are prepared to meet the challenge of developing, deploying, operating, and maintaining energy systems. Tomorrow's engineers will need to be proficient in simulation techniques, design, experimental methods, and development of advanced thermal-fluid systems to meet the world's growing needs in this area. The opportunities for energy system engineering will continue to increase in the coming years as these issues gain momentum and increase in importance. The program is run by Mike Corradini and is
administered through the Mechanical Engineering department. It has graduated 1 student since it began in 2002 and currently has no students enrolled. The curriculum is as follows (http://www.engr.wisc.edu/me/current/grad/mees_requirements.html):

- Twenty-six (26) credits of approved engineering courses are required beyond the B.S. degree.
- At least eighteen (18) credits must be formal lecture or laboratory courses (9 credits 500-level or above).
- At least twelve (12) credits must be from the list of Approved Courses.
- For a student without appropriate work experience, six (6) credits of independent study courses must be credited to meet the requirements of the degree.
- Exactly two (2) credits of graduate seminar courses, e.g., ME 903, must be credited to the degree requirements.

This program had 2 significant weaknesses. The first was that the curriculum did not meet the Master of Engineering requirements. These deficiencies have been rectified and the revised curriculum, listed above, was approved by the ME Oversight Committee and the College Academic Planning Council. Hence, there is just one remaining weakness, related to the lack of enrollment. Only one student has graduated from the program and none are currently enrolled. Several other students have entered the program, but left to pursue an MS as soon as they could secure an Assistantship. Professor Corradini has just taken over as Director of the program and will attempt to spark increased interest. Planned improvements to the program will be monitored by this Committee.

Findings

In considering the status of these programs, the ME Oversight Committee has focused on two key questions: Viability (can the program attract continued interest from students) and Quality (are there mechanisms in place to ensure that all Master of Engineering requirements are being met). In summary, based on the weaknesses identified above, our findings can be summarized as follows:

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<tr>
<th>Program</th>
<th>Viability</th>
<th>Quality</th>
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<tbody>
<tr>
<td>ME Energy Systems</td>
<td>Uncertain</td>
<td>Improving</td>
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<tr>
<td>ME Engine Systems</td>
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<td>ME Polymer Engineering and Science</td>
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Recommendations

Other than the Master of Engineering in Energy Systems, all the ME programs are currently functioning at an adequate or better level. The Energy Systems program originally did not meet the Master of Engineering curriculum requirements, but this has been rectified. They key issue now is
enrollment. They must attract more students to demonstrate viability. This will be monitored by the Oversight Committee in the coming years.

James Blanchard (EP, Chair)
for the Master of Engineering Oversight Committee
  Wayne Pferdehirt (EPD)
  Chris Rutland (ME)
  Barry van Veen (ECE)
  Steve Cramer (Assoc. Dean, ex officio)
<table>
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Sample Letter to Solicit Program Information

Director of Master of Engineering Program,

I have been asked by Steve Cramer to Chair the Master of Engineering Oversight Committee for the College. This oversight function was a required part of the authorization from UW system to offer our Master of Engineering degrees and is critical to the continued offering of the current and potentially new degrees. Part of our charge is to "ensure quality within and across all Master of Engineering offerings." In order to do this, we will have to monitor the status and progress of all such programs. Hence, we plan to meet with representatives of each of the programs some time during the Spring semester of 2008 in order to learn more about each of them.

We would like to begin this process by collecting data regarding the various programs. Hence, could you, as program director, please provide me with the data described on the next page by December 21, 2007? I've attached a draft Self Study document from 2004 that contains some of this information for each of the current programs.

If you are no longer running this program, let me know.

Thank you. Let me know if you have any questions.

Jake Blanchard

for the Master of Engineering Oversight Committee
Status of Master of Engineering Programs

- Name of Program
- Name of Director
- Date program was approved by College Academic Planning Council (if known)
- Curriculum description
- Admission requirements
- Faculty/staff participating and description of their roles
- Members of External Advisory Board (if there is one)
- Number of students currently in the program
- Number of graduates since the beginning of the program, separated out by year
- Employers of graduates (if known) – Here we are most interested in the employment of graduates who were not employed during their completion of the degree.
- Marketing status and plans – Here we would like to know how you are marketing your program and whether you have any plans for changes in the near future.
- Assessment/Improvement status and plans – Here we would like to know how you are assessing the program and how you use these assessments to improve the program. Examples include course evaluations, program evaluations, exit interviews, etc.
- Administrative home for the program and brief description of administrative staff positions
- Description of finances associated with the program by fiscal year (details of tuition revenues, instructor costs, etc.)
September 12, 2007

(Via E-Mail Only)

To: Paul Peercy, Dean, College of Engineering
From: Patrick Farrell, Provost
Subject: Follow-up on the 2004-05 Joint Review of the Master of Engineering
Copies: Steven Cramer, Associate Dean, College of Engineering
Judith Kornblatt, Associate Dean, Graduate School

Reply requested by November 15, 2007

The Master of Engineering was implemented in 1998 and underwent a joint review in 2004-05. The findings of the joint review, which are summarized in the attached memo, required a follow-up review in the fall of 2007. The purpose of this memo is to request that you proceed with that follow-up review.

The follow-up review is to be narrowly focused on the six questions listed in the attached memo. They focus on the oversight structure, assessment of student learning, and mechanisms for monitoring the program as it evolves. In order to complete this follow-up review in the 2007-08 academic year, please send me a report that addresses the six questions by November 15, 2007.

When I receive the report we will reconvene the joint review committee and ask them to consider the report. The new joint review committee will include as many members of the 2004-05 committee as are still available and willing to serve. We will add new members as necessary. The original members were Stephen Robinson (chair), Wayne Pferdehirt (program representative), John Strikwerda (GFEC representative, now retired), and Fran Garb (UW System Admin representative, now retired). Stephen Robinson, who chaired the original committee, is scheduled to retire at the end of the fall semester. It would be a great advantage to complete this review while he is still available so there will be continuity from the previous work.

When the review committee has completed its work, the report and recommendations of the joint review committee will be considered by the Graduate Faculty Executive Committee and then by the University Academic Planning Council. After that, I will send the report with my recommendation to UW System Administration. UW System Administration makes the final decision about the disposition of the review and continuation of the program.

If you have any questions please consult Jocelyn L. Milner (jmliner@wisc.edu, 263-5658) who will oversee this process. Also, please consult Jocelyn if you anticipate that the November 15 target date doesn’t provide enough time for the report to be prepared. Jocelyn can assist you if you need copies of any of the documentation from the 2004-2005 joint review or any additional information.

Attachment
May 12, 2005

TO: Peter Spear, Provost and Vice Chancellor
    UW-Madison

FROM: Ronald M. Singer
        Associate Vice President

RE: Joint Review of the Master of Engineering

The University of Wisconsin Board of Regents authorized implementation of the Master of Engineering on March 6, 1998. The program was implemented in the Summer 1998 and underwent the required Joint Review in 2003-04. The Office of Academic and Student Services received your letter of recommendation based on the report of the Joint Review Committee on May 2, 2005. The committee reviewed the original program proposal, the program self study, letters from two outside reviewers, and a memo from the dean of the College of Engineering. Upon request, Associate Dean Patrick Farrell of the College of Engineering provided additional information.

The Joint Review Committee recommended that this program be continued at this time but that a final recommendation be delayed for three years. During that time, the oversight structure described in the original program proposal should be implemented. In Fall 2007, the joint review should be reactivated to focus specifically on the following six questions:

1. What structure has been established to “oversee the creation and management of each of the Master of Engineering programs” per the authorization of the ME degree? What evidence has been provided to show that this structure is actively ensuring quality within and across all Master of Engineering offerings?
2. What are the assessment criteria for the degree programs? Assessment should address practices for evaluating and continuously improving: (1) individual courses with each program; and (2) the curriculum, instructional design, and student support of each degree program.
3. What are the criteria for determining whether a degree program needs to be modified in light of changes in the instructional staff and external environment?
4. What are the criteria for determining whether to approve additional Master of Engineering degree programs or to discontinue a current program?
5. What are the criteria to detect whether a degree program has slipped or shifted from its intended purpose?
6. What has been done about the vulnerability of the Master of Engineering – Technical Japanese program?
I accept your report and recommendation. We will place the Master of Engineering program on the joint review schedule for Fall 2007, at which time a final focused review will take place.

I would like to thank all who participated in this review and to commend your faculty for the thorough review process. If you have questions regarding this action, please let me know.

cc: Cora B. Marrett, Senior Vice President for Academic Affairs
    John Wiley, Chancellor
    Sharon Wilhelm, Interim Associate Vice President, OPAR
    ACSS Program Planning Team

...\acis0405\msn engineering jnt review postponed.doc
April 28, 2005

To:        Ronald M. Singer, Associate Vice President for Academic Affairs  
            UW System Administration

From:      Peter D. Spear, Provost

Re:        Joint Review of the Master of Engineering

The University of Wisconsin-Madison portion of the joint review of the Master of Engineering is now complete.

The Master of Engineering degree program was designed and implemented as an umbrella degree for a series of distinct M. Engr. programs. Consequently, the review was of both the oversight structure for support of the degree and of the individual programs. The review committee found that, for the most part, individual programs, as exemplified by the Master of Engineering – Professional Practice, have made commendable progress and developed a strong academic foundation. The review committee did identify concerns about the Technical Japanese option and about assessment, which are described in their report. The review committee also found that the oversight structure that was originally proposed had not been established. The review committee deemed the implementation of this oversight structure to be essential to the ongoing success of all programs operating within the M. Engr. degree structure.

The reviewers have recommended that the current M. Engr. programs be continued for the present, that the oversight structure be implemented, and that the review be reactivated in fall 2007. The 2007 review would focus specifically on the following six questions:

1. What structure has been established to “oversee the creation and management of all of the Master of Engineering programs” per the authorization of the M. Engr. degree? What evidence has been provided to show that this structure is actively ensuring quality within and across all M.Engr. offerings?

2. What are the assessment criteria for the degree programs? Assessment should address practices for evaluating and continuously improving: (1) individual courses with each program; and (2) the curriculum, instructional design, and student support of each degree program.

3. What are the criteria for determining whether a degree program needs to be modified in light of changes in the instructional staff and external environment?

4. What are the criteria for determining whether to approve additional Master of Engineering degree programs or to discontinue a current program?

5. What are the criteria to detect whether a degree program has slipped or shifted from its intended purpose?
6. What has been done about the vulnerability of the Master of Engineering – Technical Japanese?

I forward this recommendation to you with the endorsement of the Graduate Faculty Executive Committee and the University Academic Planning Council.

The self study, the letters from the external reviewers, and the report of the program review committee are enclosed with this memo. If you have further questions or need additional documentation please contact me or Jocelyn Milner.

We are very grateful for the participation and guidance provided by Dr. Frances Garb who represented your office on the review committee.

Attachments

Copies: Paul Peercy, Dean, College of Engineering
Pat Farrell, Associate Dean, College of Engineering
Martin Cadwallader, Dean, Graduate School
Jocelyn Milner, Director, Academic Planning and Analysis
To: Peter D Spear, Provost

From: Stephen Robinson, Professor of Industrial and Systems Engineering
     Joint Review Committee Chair

Fran Garb, Senior Academic Planner, UW System

Wayne Pferdehirt, Director Engineering Distance Degree Programs

John Strikwerda, Professor of Computer Sciences

Subject: Joint Review for the Master of Engineering

This is the report of the Joint Review Committee appointed by your letter of September 3, 2004 and charged to review the Master of Engineering (ME) program and to report by December 15, 2004. In late November 2004 we notified you that because of complicating factors in the program the review could not be completed by December 15 but should be completed early in 2005.

Background

The committee met to discuss this unique program on November 9, 2004. Prior to that meeting, committee members reviewed the program self-study, a memo from the dean of the College of Engineering, the original program proposal and the executive summary of that document, and letters from two outside reviewers. During the meeting, the members of the committee reviewed the documents and clarified their charge. It became clear that we did not have sufficient information to address the issues included in your September 3, 2004 memo. The committee chair then requested additional information from Associate Dean Patrick V. Farrell of the College of Engineering, who provided this information in a memo dated December 17, 2004. The members of the committee reconvened on January 6, 2005 to discuss that additional information and to determine the substance of this report.

This program is more complex than most because of its unique structure. The Board of Regents authorized the College of Engineering to implement “a structure for a series of degrees and options, rather than the degrees and options themselves.” Degree and options would all conform to a template but could be customized for the discipline. Central to the program was the creation of “a Graduate Program Committee to oversee the creation and management of each of the Master of Engineering programs.” There are currently several
degree programs in various stages of implementation. We reviewed these degree options, and our comments on them follow. However, the Graduate Program Committee has not been formed and so it was not possible for us to review the structure of the program.

**Findings**

The self-study and external reviewers’ comments indicate that in the five years since initial approval of the ME degree, the College of Engineering has made commendable progress in developing new, “practice-focused interdisciplinary degrees,” each with a designated area of focus.

The three ME programs that are most advanced in their development are the ME in Professional Practice (MEPP), ME in Technical Japanese (METJ) and ME in Engine Systems (MEES). The current operations of these programs indicate that the College is meeting the goal of serving new student populations through its development of ME degrees. Students in these programs are mid-career professionals, who would be unlikely to interrupt their careers to move to Madison or any other UW campus. The practice-oriented curricula and the convenient distance format are enabling UW to effectively deliver innovative graduate education to new groups of adult students. The other two programs listed as “current options” in the self-study are the ME in Polymer Engineering and Science (MEPES) and ME in Energy Systems (MEEnergyS), but these had been operating for less than one year as of the date of the self-study, and in our view neither of them had enough of an operational record to support the level of evaluation intended in a five-year degree review.

With one exception, the review committee has no serious concerns about the individual degree programs. The MEPP program is the most mature program developed thus far under the Master of Engineering umbrella. MEPP has achieved a strong record of academic excellence, evidenced by several major national and international awards for the program. In so doing, MEPP provides strong evidence that the ME degree can be and is being used to strategically advance the College’s and University’s role in delivering world-class education to adult students learning at a distance.

Most of the comments provided by external reviewers Dr. Frank Burris and Dr. Stuart Walesh focused on MEPP, the degree program with which reviewers were most familiar. Dr. Burris concluded: “There is little question in my mind that UW-Madison has made a creative contribution to the profession with MEPP. Its national standing in engineering will only be enhanced by the continued growth and success of MEPP and similar Master of Engineering programs.”

Our one area of concern with individual programs has to do with the vulnerability of the METJ program. This program is staffed by only one faculty member. A one-person faculty leaves the program and students’ studies inordinately susceptible to interruption. Also, the sole-faculty model substantially limits the program’s ability to expose students to a broad range of perspectives in their studies. Attention to this issue would strengthen the current and future viability of this program.
A second general area of concern is assessment. The assessment methods used by the individual degree programs need systematic review by the College to ensure thoroughness of assessment practices and an integration of lessons learned within and across all ME degree programs. The Committee reviewed assessment practices used by the MEPP program to assess courses, the overall program, and impacts on graduates’ careers. These practices appear thorough, and data that were provided showed how assessments are being used to improve the program. We understand that these practices are being adapted and applied to MEES as that program continues to develop. The Committee has not received sufficient information to review the effectiveness of evaluation practices employed in the METJ, MEPES and MEEnergyS degree programs, especially the portions of these programs that serve off-campus students. The nature of the programs and the charter under which they were developed indicates that they should be assessed more completely than is possible using only the standard course evaluation forms of the College of Engineering. In particular, there should be an overall assessment of the programs’ learning outcomes that is more than the sum of the individual course evaluations. The Committee has been provided no evidence that this is presently occurring.

Members of the review committee determined that the individual programs created under the ME umbrella, that have been operating for long enough to be evaluated, are for the most part doing well. However, the committee has a serious concern about the umbrella structure itself, which we explain next. Because of that concern, we recommend that final approval of this program be delayed.

The proposal to authorize the Master of Engineering program states that the approval is for “a structure for a series of degrees and options, rather than the degrees themselves.” It adds, “A Graduate Program Committee within the College will review proposals for new options and will administer the programs of the graduating students.” No such structure has been established: in particular, there is no Graduate Program Committee. Proposals for new degrees in the ME program have been reviewed by the College of Engineering Academic Planning Council, as they should be. The APC is, however, not an adequate management structure for the ME programs. Thus, without a structure to evaluate, the review committee was unable to fulfill its charge.

The proposal for the ME program states that “the topics emphasized by these programs are expected to shift fairly rapidly as the relevant industrial practices evolve.” If the ME program is to respond to the shifts whose existence motivated its establishment, it is imperative that there be some program oversight to assess which new degrees should be offered, which should be modified as conditions change, and which should be discontinued.

Because the existing ME degree programs are laudable, the review committee recommends that the program continue but that a final recommendation be delayed for three years. In the interim, the College needs to systematically review processes used to assess and improve all ME degrees to ensure appropriateness, thoroughness and effectiveness of those practices. In addition, the College of Engineering should use this
time to establish the management structure described in the authorization, including the Graduate Program Committee. This committee will oversee the several degree programs so that the ME program can fulfill its intended role. The College must establish this management structure quickly enough so that there is a record of program operation that can be evaluated three years from now (see below).

Our second recommendation is that this review be reactivated in the fall semester of 2007 to reexamine the management of the Master of Engineering program. The emphasis of that review should be on the management structure of the program and on how effectively that structure is working, rather than on the details of individual programs. We suggest that the review in Fall of 2007 should focus on the following questions.

1. What structure has been established to “oversee the creation and management of each of the Master of Engineering programs” per the authorization of the ME degree? What evidence has been provided to show that this structure is actively ensuring quality within and across all ME offerings?
2. What are the assessment criteria for the degree programs? Assessment should address practices for evaluating and continuously improving: (1) individual courses with each program; and (2) the curriculum, instructional design, and student support of each degree program.
3. What are the criteria for determining whether a degree program needs to be modified in light of changes in the instructional staff and external environment?
4. What are the criteria for determining whether to approve additional Master of Engineering degree programs or to discontinue a current ME program?
5. What are the criteria to detect whether a degree program has slipped or shifted from its intended purpose?
6. What has been done about the vulnerability of the METJ program?

Summary of recommendations

The review committee recommends:

1. That the established degree options within the ME program continue pending final approval following the 2007 review. Program-level assessment in the on-campus programs should be strengthened.
2. That the College of Engineering establish a management structure for the ME program, including the Graduate Program Committee described in the program authorization documents.
3. That this review be reactivated in the Fall semester of 2007 to reexamine the management of the ME program, focusing on the six questions stated in the previous paragraph.
May 13, 2004

Peter D. Spear, Provost
University of Wisconsin-Madison
150 Bascom Hall
Madison Campus

Dear Peter:

At its meeting on May 12, 2004, the College of Engineering Academic Planning Council unanimously approved the Five-Year Review report for the Master of Engineering degree. The Master of Engineering program offers degrees that are intended to be practice-focused interdisciplinary degrees which allow students to focus on an area of engineering practice that require courses and experience in a variety of engineering and non-engineering disciplines.

I support this recommendation and would ask that the proposal be submitted to the University Academic Planning Council at its earliest convenience. Enclosed with this letter is a brief overview of the degree option.

If you need additional information or have questions, please contact my office.

Sincerely,

Paul S. Peercy
Dean

PSP: cbb
Enclosure
1.1 Program Description and Context

1.1 Goals and Objectives
The Master of Engineering program offers degrees that are intended to be practice-focused interdisciplinary degrees. The program offers degrees with options to designate an area of specialization. These specializations allow students to focus on an area of engineering practice that will require courses and experience in a variety of engineering and possibly non-engineering disciplines. In contrast, current Masters of Science in Engineering degree programs usually seek depth in a specific field of engineering, rather than breadth across disciplines. Most of the options in the current Masters of Engineering program are available at a distance, and two of them (Engineering Practice and Engine Systems) are available only in a distance education format.

The current options available in this program are:
- Technical Japanese (E)
- Polymer Engineering and Science (M E)
- Engineering Practice (E)
- Engine Systems (E)
- Energy Systems (M E)

A brief description of each of these options is provided below.

The Master of Engineering in Technical Japanese (METJ) option provides participants with the advanced skills and knowledge that are necessary to interact effectively with Japanese counterparts in the technical or business arena. At the basic or intermediate level the main focus is language instruction; at the advanced level the emphasis shifts to current problems and accomplishments in the spheres of Japanese economic activity and Japanese technology.

The Master of Engineering in Professional Practice (MEPP) option is designed to provide mid-career engineers with the skills, tools, and insights needed to be more effective as technical leaders of engineering projects and organizations. The degree program serves engineers from all disciplines and provides an effective alternative to an MBA or discipline-specific M.S.

The Master of Engineering in Engine Systems (MEES) option is targeted at working engineers in the automobile and internal combustion engine industries. The degree focuses on technical integration of the disciplines required in the design and development of internal combustion engines and vehicle powertrain systems. As such it emphasizes breadth within a specific industry, in contrast with the research depth of an on-campus Master of Science degree.

The Master of Engineering in Polymer Engineering and Science (MEPES) option prepares engineers and scientists for professional practice in the polymer industry. The degree draws on
the interdisciplinary nature of design, processing, and manufacturing with polymers. Graduates are typically employed by the plastics industry or by other polymer manufacturing businesses. This is the first graduate degree labeled Polymer Engineering and Science in the Big Ten.

The Master of Engineering in Energy Systems (MEES) option provides candidates with an advanced education in energy fundamentals that include the principles of thermodynamics, heat transfer, and fluid mechanics. These disciplines and their associated conservation laws are the foundation of all energy systems analyses. They can be applied, along with optimization and economics, to effectively solve a wide variety of energy system and environmental problems.

The overall Masters of Engineering degree program has been in existence for 5 years, but the ages of the various options varies from almost 5 years (METJ) to less than one year (MEES and MEEnergyS). While the options focus on their separate technical areas, they share the overall interdisciplinary theme of the program, a target audience of working, off-campus (and in some cases, on-campus) students, and much of their support structure. For several of the following sections of this report, the individual options may be highlighted, as their contexts, needs, enrollments, and curricula do differ. For some sections (e.g. Academic Support Services), the options will be combined.

1.2 Context
The Technical Japanese Program has existed within the College of Engineering since 1982; a Certificate in Japanese Studies for Engineering Majors has been available to undergraduates since 1987. In 1990 the Technical Japanese Program began offering credit courses to engineers and managers in companies and government laboratories around the country, and a Certificate in Technical Japanese Studies for Professionals was introduced in 1993. Today, roughly half of the students enrolled in courses offered by the Technical Japanese Program are professionals, who participate via distance education technology. This METJ degree represents a credential that is attractive to professionals whose careers are linked to interactions with Japanese companies, Japanese technology and the Japanese market. The METJ option was first offered in 1999.

The MEPP (Masters of Engineering in Professional Practice) serves adult, working engineers, located across the world. These engineers would not have interrupted their careers to relocate to Madison to pursue graduate studies. As UW-Madison's first completely Web-based degree, MEPP enables mid-career engineers living anywhere, to pursue a world-class graduate engineering degree without interrupting their careers or compromising work and family commitments. This option provides working engineers an opportunity to develop technical expertise in areas such as technical program management, engineering problem solving with computers, and international engineering while including communication, quality and business issues that many practicing engineers need to use. The technical focus distinguishes the degree from a business degree (MBA) while the interdisciplinary breadth is quite different from a traditional MS degree. The MEPP option was first offered in 1999.

MEES (Masters in Engineering in Engine Systems) is new within the Master of Engineering program, beginning in 2003. This program was developed to meet the specific needs of the internal combustion engine industry – an industry especially important to the economy of the state of Wisconsin, as many engine manufacturers and suppliers are located here. A unique
feature of the program is the perspective of a broad technical systems approach to the topic rather than focusing on the issues of a single discipline (like Mechanical Engineering). There are no similar programs at other universities that we are aware of.

The MEPES program is an outgrowth of a long history of work in polymers at UW-Madison. Polymer engineering activities at the University of Wisconsin-Madison date back to 1946 when Professor Ronald Daggett first included plastics in the mechanical engineering curriculum. To date, the group has grown to nine faculty members with a wide variety of expertise and research interests. The breadth and depth of research activities at the Polymer Engineering Center (PEC) and its sister Rheology Research Center (RRC) at UW-Madison have made them among the nation's strongest research groups in arenas of mechanical engineering, polymer engineering, and Rheology research. The MEPEC (Master of Engineering in Polymer Engineering and Science) opened in fall of 1998.

The MEEnergyS (Masters of Engineering in Energy Systems) option is very new within the Master of Engineering program, beginning in 2003. Energy systems utilize primary energy forms to accomplish desired tasks. From industrial applications to manufactured products to the transportation that allows mobility of people and goods throughout the world, energy systems are the common thread that transforms primary energy sources to accomplish useful work. Energy systems also play an increasingly important role in a number of environmental issues such as indoor and outdoor air quality, ozone depletion, and global warming. With growing recognition of our dependence on foreign oil (a finite primary energy source), the importance of advancing capabilities in energy systems and technologies has never been higher. ....

1.3 Need
METJ: Although the scope of technical cooperation between Japanese and American companies continues to increase, only two universities (University of Washington; UW-Madison) in the United States offer a degree with an emphasis on technical Japanese. Participation in the program at the University of Washington is limited to full-time students on the Seattle campus. Approximately 5-8 students enroll in this Master of Science in Engineering (Technical Japanese) program at the University of Washington each year. The METJ program at the UW-Madison thus represents a unique educational opportunity, in that professionals may participate while continuing full-time employment anywhere in the world.

MEPP: The curriculum of the MEPP degree program was developed directly in response to surveys of engineers and engineering employers. The draft curriculum was tested through follow-up surveys. The intentional problem-based instructional design of the program meets the learning interests of adults and the needs of practicing professionals. The Web-based format meets the reliability, mobility, and interactivity needs of mobile professionals, participating from wherever their travels take them.

MEES: Development of internal combustion engines requires the integration of skills from a wide variety of disciplines within mechanical engineering, and increasingly material science and electrical engineering. Market studies conducted prior to developing this degree confirmed that the industry has difficulty identifying engineers with the breadth of technical skills to effectively
lead engine development programs. The MEES option was developed specifically to address this industry need.

MEPES: According to the Society of the Plastics Industry, the plastics industry is the fourth-largest manufacturing industry in the United States, accounting for approximately $331 billion in annual shipments and more than 1.5 million direct employees nationwide. The plastics industry continually faces new customer demands, furious global competition, spiraling oil prices, and growing environmental concerns. Furthering polymer-engineering education has been a main goal of the members involved with the PEC. This Masters of Engineering degree can be achieved via either residential or outreach programs. That is, engineers can obtain the Masters of Engineering degree or the Certificate from UW-Madison while fulfilling commitments at work or at home.

MEEnergys: Students in Mechanical Engineering obtain an education that includes the principles of thermodynamics, heat transfer, and fluid mechanics. These disciplines and their associated conservation laws are the foundation of all energy systems analyses. There is an increasing demand in industry for students who are well-grounded in the range of fundamentals and practice that impact energy development, distribution, and use. In the undergraduate curriculum, however, there is little opportunity to integrate these topics and others such as optimization and economics together so that they can be effectively used in applied studies of energy systems. Achieving improvements in energy systems technology will require engineers with advanced studies and experiences that extend beyond what can be provided within an undergraduate Mechanical Engineering curriculum. This is provided by the Masters of Engineering program in Energy Systems.

2. Personnel

2.1 Faculty
The faculty for the Masters in Engineering are drawn primarily from UW-Madison faculty and staff. In addition, some programs invite practitioners to participate in teaching courses. As might be expected, the faculty is drawn from many departments within and outside of the College of Engineering. Current faculty distributions will be described below for each of the options:

METJ--The primary faculty member participating in this program is Professor James Davis of the Department of Engineering Professional Development. Professor Davis directs the program and currently teaches all of the courses.

MEPP--Program faculty include Engineering Physics, Industrial Engineering, Engineering Professional Development, and the School of Human Ecology.

MEES--Five faculty members are from the UW Department of Mechanical Engineering and two are from the Department of Engineering Professional Development.

MEPEC--The primary faculty members participating in this program are three faculty of the Department of Mechanical Engineering.
MEEnergyS – The faculty for this the program are Mechanical Engineering and Engineering Physics faculty with interests in the energy area.

2.2 Administrative Structure
To promote efficient operation and to reduce costs the various options available under the framework of the Master of Engineering degree share administrative resources to the greatest degree possible. On-campus students are provided administrative support through an existing department (EPD or ME).

Ms. Karen Al-Ashkar serves as the advisor for students in the METJ, MEPP and MEES options of the Master of Engineering degree. She is responsible for receiving and tracking student applications, advises students about courses and financial aid, and deals with all other student issues that might affect their continued participation in the program.

Helene Demont directs the Engineering Outreach Program, which serves degree and non-degree students who enroll in College of Engineering courses at a distance. She registers off-campus students, is responsible for distribution of videotapes and CD-ROM, and assists with marketing.

Robert Perras manages Engineering Media Services, which provides technical support for the studio and web facilities that are used to make the MEPES courses available to off-campus students.

Support for the College’s Web-based degree programs is provided through the Department of Engineering Professional Development, and coordinated by Wayne Pferdehirt, Director of Engineering Distance Degree Programs.

2.3 Adjunct/Part-time Faculty
The industry focus of this degree necessitates significant industrial experience in teaching some courses. A strong academic background and prior teaching experience are required for these roles. The different options in this degree use different adjunct faculty, and in some cases, use none.

METJ—none.

MEPP—currently, three (one an emeritus professor from UW-Milwaukee Business School, and two highly respected private engineering consultants).

MEES—currently one (from Harley-Davidson), two more are likely (from Diamler-Chrysler and General Electric).

MEPEC—none.

2.4 Training and Support:
Training and technical support services for all options are provided by Engineering Media Services and by the Department of Engineering Professional Development.
3. Students

3.1 Enrollment Trends

METJ—

Although no students were admitted during the implementation year (1999), a steady pattern of admission of new students and graduation of current students has emerged. A chart containing enrollment data follows:

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<tr>
<td>New students admitted</td>
<td>0</td>
<td>14</td>
<td>7</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Students who withdrew</td>
<td>0</td>
<td>6</td>
<td>3</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Total enrollment</td>
<td>0</td>
<td>8</td>
<td>8</td>
<td>9</td>
<td>13</td>
</tr>
<tr>
<td>Graduating students</td>
<td>0</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

Off-campus students represent 26 of the 33 students who were admitted, nine of the 11 students who graduated, ten of the 11 students who withdrew and eight of the 11 students who are currently active. Nine of the ten professionals who withdrew from the program did so because of changes in employment.

MEPP—

The MEPP program is designed to admit 30 students each year. Typically, the Admissions Committee offers admission to 32-35 students and actual admissions range from 29 to 32. Each admitted Class of students study together as a stable cohort, as they progress through the fixed, two-year curriculum. The number of students admitted to, continuing in, and graduated from the program to date are summarized below.

<table>
<thead>
<tr>
<th>Year</th>
<th>1999</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
</tr>
</thead>
<tbody>
<tr>
<td>New students admitted</td>
<td>24</td>
<td>31</td>
<td>29</td>
<td>29</td>
<td>32</td>
</tr>
<tr>
<td>Continuing students</td>
<td>23</td>
<td>32</td>
<td>29</td>
<td>29</td>
<td></td>
</tr>
<tr>
<td>Total Enrollment</td>
<td>54</td>
<td>61</td>
<td>58</td>
<td>61</td>
<td></td>
</tr>
<tr>
<td>Graduating students</td>
<td>22</td>
<td>30</td>
<td>30</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Students entering MEPP are required to have a B.S. from an ABET accredited engineering program. Several MEPP students have also had M.S.’s and M.B.A.’s. Two students to date had previously earned Ph.D.’s.
MEES---
Little data is yet available as only the pilot class has been admitted. One of these students lost employment and was forced to withdraw.

<table>
<thead>
<tr>
<th>Year</th>
<th>2003</th>
<th>2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Students Admitted</td>
<td>13</td>
<td>0</td>
</tr>
<tr>
<td>Planned New Admissions</td>
<td>0</td>
<td>17</td>
</tr>
<tr>
<td>Students who withdrew</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

MEPEC---

MEEnergySystem---
No students have entered the program at this time.

3.2 Degree Recipients
As mentioned above, most of the participants in this program are professionals who are employed by corporations or the U.S. government.

METJ: Since employers provide tuition for their employees to participate in this program, it is not surprising that the nine professionals who have graduated to date remain employed by the organizations that supported them through the program.

MEPP: Surveys of the first three graduating classes have shown that by graduation, 53% of MEPP students had already achieved a promotion or significant salary increase that they significantly attributed to their participation in MEPP.

3.3 Projected Enrollment
METJ-- It is expected that total enrollment for the METJ option will stabilize at 13-15 students, with 4-5 new students entering and 4-5 students graduating each year. Students remain in the program for 3-4 years, and that number is not expected to change.

MEPP— The MEPP option is designed to admit 30 students each year. Typical total enrollment for the two-year program is 60 students. MEPP’s success in filling incoming classes is expected to continue as the program continues to grow in reputation and number of alumni.

MEES— The business plan for MEES calls for admitting 17 students each year.

MEPEC-- Projected enrollment has not yet been ascertained.

MEEnergyS-- Projected enrollment has not yet been ascertained.

4. Program Descriptions and Evaluation

4.1 Curriculum
METJ--A typical curriculum for a student in the METJ option follows:
<table>
<thead>
<tr>
<th>Season</th>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>fall</td>
<td>EPD 330</td>
<td>Basic Technical Japanese I</td>
<td>3 cr.</td>
</tr>
<tr>
<td>spring</td>
<td>EPD 332</td>
<td>Basic Technical Japanese II</td>
<td>3 cr.</td>
</tr>
<tr>
<td>fall</td>
<td>EPD 374</td>
<td>Intermediate Technical Japanese I</td>
<td>3 cr.</td>
</tr>
<tr>
<td>spring</td>
<td>EPD 375</td>
<td>Intermediate Technical Japanese II</td>
<td>3 cr.</td>
</tr>
<tr>
<td>fall</td>
<td>EPD 430</td>
<td>Japanese for Business and Industry</td>
<td>3 cr.</td>
</tr>
<tr>
<td>spring</td>
<td>EPD 530</td>
<td>Advanced Technical Japanese Seminar</td>
<td>3 cr.</td>
</tr>
<tr>
<td>fall</td>
<td>EPD 630</td>
<td>Research in Japanese Technical Literature*</td>
<td>3 cr.</td>
</tr>
<tr>
<td>spring</td>
<td>EPD 630</td>
<td>Research in Japanese Technical Literature*</td>
<td>3 cr.</td>
</tr>
</tbody>
</table>

*This course is repeatable for credit, since completely new material is introduced each semester.

MEPP—The curriculum consists of 26 credits, with no electives—all courses are required. All courses were developed specifically for students participating in the MEPP program. Course content and format were developed for the specific learning needs and interests of MEPP students—highly motivated adult learners with substantial professional experience in the practice of engineering, learning at a distance.

A summary of the MEPP curriculum follows:

**Year 1 Summer**
- EPD 378: Network Skills for Remote Learners (1 credit)
- Summer Residency late August, on campus

**Year 1 Fall**
- EPD 612: Technical Project Management (3 credits)
- EPD 611: Engineering Economic Analysis and Management (3 credits)

**Year 1 Spring**
- EPD 617: Communicating Technical Information (3 credits)
- EPD 348: Engineering Problem Solving with Computers (3 credits)

**Year 2 Summer**
- EPD 615: Independent Reading and Research in Applied Engineering (1 credit)
- Summer Residency; late August, on campus

**Year 2 Fall**
- EPD 613: International Engineering Strategies and Operations (3 credits)
- EPD 416: Engineering Applications of Statistics (3 credits)

**Year 2 Spring**
- EPD 518: Quality Engineering and Quality Management (3 credits)
- EPD 519: Engineering Business Data Communications (3 credits)

MEES—The curriculum consists of 27 credits, with no electives—all courses are required. Each course is being developed specifically for MEES, and specifically for web instruction. None of the courses have yet been approved. The planned courses are as follows:

- Network Skills (1 credit)
- Performance and Combustion in Engines (3 credits)
Engine Design I (3 credits)
Engine Application Project (2 credits)
Engine Fluid Dynamics (3 credits)
Engine Design II (3 credits)
Engine Systems and Control (3 credits)
Computer-Based Problem Solving in Engine Development (3 credits)
Analysis of Trends in Engines (3 credits)
Engine Project Management (3 credits)

MEPEC— A typical curriculum for a student in the MEPES option may consist of:

- ME 417 Introduction to Polymer Processing
- ME 418 Engineering Design with Polymers
- ME 525 Macromolecular Hydrodynamics
- ME 601 Introduction to Electromechanics of Continuous Media
- ME 699 Advanced Independent Study
- ME 708 Advanced Composite Materials
- ME 717 Advanced Polymer Processing
- ME 925 Rheology Research Seminar

Twenty-four (24) credits of required polymer science courses are required beyond the BS degree.

- At least eighteen (18) credits must be formal lecture or laboratory courses.
- At least six (6) credits must be formal lecture or laboratory courses numbered 600 or higher.
- At least three (3) credits must be formal lecture or laboratory courses numbered 700 or higher.
- No more than six (6) credits of independent study and no more than two (2) credits of seminar are allowed.
- No transfer credits are allowed.

Weekly seminars on rheology and polymer engineering supplement the formal lecture courses.

MEEnergyS - The degree program is administered by the department of Mechanical Engineering. The candidate must be admitted into graduate studies in Mechanical Engineering in order to enroll in this program.

Twenty-six (26) credits of approved engineering courses are required beyond the B.S. degree. Approved courses include all formal graduate-level courses in the Engineering College that are documented in the Graduate School Catalog. Students must meet with an advisor or with the Director of the M.E. program to select their courses. A list of approved courses is provided on the MEEnergyS website (http://www.engr.wisc.edu/me/current/grad/mees.html)

A summary of degree requirement is as follow:

26 credits (2 semesters), consisting of:
18 formal lecture or laboratory courses
12 credits from approved course list
Note: M.S. thesis credits are not counted

4.2 Diversity
METJ--An understanding of Japanese culture is inherent in mastery of the Japanese language. Elements of Japanese culture and Japanese thought are incorporated into discussions of Japanese language and manner of expression in EPD 330, 332, 374 and 375. Japanese business practices are analyzed in EPD 430. The target population for students in the Master of Engineering program is practicing engineers in industry. Among the 33 students who have been admitted to the METJ option three students (approximately 10%) were minority students. Of these three students one person graduated, one person is expected to complete the program during the current year and one person withdrew. In that sense the minority student population has the same track record as the overall student population in the METJ option.

MEPP--Admission is open to engineers living or working anywhere in the world. To date, one engineer permanently living outside the U.S. (Mexico) has enrolled in the program. Approximately 7% of students admitted to MEPP have been foreign nationals living in the U.S. Approximately 11% of admitted MEPP students are female. MEPP was one of several Web-based programs featured in an article by the Society of Women Engineers, highlighting the attractiveness of this learning format to female engineers, especially those who are trying to pursue graduate studies while fulfilling the demands of parenting young children.

MEPP graduates have reported that one MEPP course in particular has helped them improve their abilities to understand and effectively work with people from other cultures. International Engineering Strategies and Operations explores the meaning of culture, significant differences among cultures, and ways to effectively work with colleagues, customers and suppliers from other cultures.

MEES--The program is intended to be attractive worldwide, and efforts will be made to recruit students from around the world. The pilot class of 13 includes one woman and two persons of color. One of the students is a Canadian citizen; the remaining 12 have U.S. citizenship.

MEPEC--Polymer Engineering and Rheology enjoys international support, and both faculty and students from many cultures and countries have come to Madison to be part of the program.

MEEnergyS – Admission is open to any candidates who qualify for an advanced degree in Mechanical Engineering.

4.3 Assessment
METJ--Students in all courses are provided with opportunities to evaluate the course and the instructor. Suggestions from students have been incorporated into revisions of the syllabus in EPD 374, 375, 430, 530 and 630.

MEPP—The program uses a rigorous evaluation system to regularly evaluate and improve individual courses and the overall program. Formal elements of the evaluation program include:
an end-of-semester evaluation of each course by students and the instructor (most courses also use one or more mid-semester evaluations); a detailed programmatic evaluation by students at graduation; and a program impact survey conducted 9-12 months after graduation that includes graduates, their supervisors, and family members.

In 2003 MEPP received funds from the UW-Madison Office of the Provost to review and improve its assessment processes. This study was conducted by Dr. Greg Kearsley, an internationally recognized expert in online instructional design and evaluation. Dr. Kearsley, while providing several recommendations for improvement, concluded, “After reviewing the results and methodology from many program evaluations, the main conclusion of this study is the current MEPP evaluation scheme is better than those employed in almost all other graduate programs at higher education institutions” (Kearsley, Greg, “Evaluation and Improvement of Post-Graduate Program Impact Assessment Methods for the MEPP and Related Engineering Distance Degree Programs,” September 2003).

Overall, the quality, impact and cost effectiveness of MEPP were externally evaluated by the University Continuing Education Association (UCEA) and the U.S. Distance Learning Association (USDLA). In 2002 UCEA selected MEPP for its top award for new continuing education programs, the Outstanding Program Award (Credit Category). MEPP also earned UCEA’s Distance Learning Community of Practice Program of Excellence Award. The award honors a distanced-delivered program that is innovative and exemplary in meeting the needs of students. UCEA judges said, “This Masters of Engineering in Professional Practice is as good as it gets as a model of the development, implementation, and maintenance of a distance education degree program.” In 2003 MEPP was selected by USDLA to receive its Excellence in Distance Learning Programming, its top award for distance degree programs.

MEES--Students in all courses are provided with opportunities to evaluate the course and the instructor. Suggestions from pilot students are being incorporated as new courses are developed.

MEPEC and MEEnergyS--Students in all courses are provided with opportunities to evaluate the course and the instructor.

4.4 Accreditation
Not applicable for any of the options.

4.5 Concerns
Faculty Support: It is vitally important that College and University administrators and policies reinforce the importance, value, and support for COE distance degree programs as these programs are all offered at a distance, some exclusively so. It is important that faculty and their departments see these responsibilities as part of the College’s core mission and not an “add-on”. It is critical that the College’s strategic plans, faculty evaluation processes, and staffing plans reinforce the key role of ME distance degree programs to the College’s efforts to improve its stature and national ranking.

Hiring: Current UW-Madison personnel classifications present a hindrance to hiring qualified staff for distance education programs. For example there are no classifications for instructional
designer or document manager, two key responsibilities in developing and delivering Web-based courses. The current system requires that clear position descriptions be rewritten to obfuscate details and allow use of an existing personnel classification category, making hiring unnecessarily complex, inefficient and long.

Financial Support for Non-Sponsored Students: The lack of available scholarship funds has left the program unable to assist highly qualified applicants unable to pay the entire cost of the programs themselves. This has limited the ability of MEPP, for example, to serve the needs of engineers working for governmental agencies in Wisconsin. Development of a scholarship fund to meet the needs of these engineers, their organizations and the constituencies they serve is highly desirable.

4.6 Third Party Vendors
None.

5. Academic Support Services

5.1 On-going Support
The Wendt Library provides support for electronic reserves and retrieval of requested references. UW-Extension supports several critical elements for some of the options’ instructional technology, including Web conferencing (via WisLine Web) and document management (via Extension’s DocuShare server). DoIT supports the course management server and software (WebCT). The College’s Engineering Media Services supports development of video materials, CD/DVD duplication and billing.

5.2 Additional Support
Marketing efforts are conducted by the Engineering Outreach Program and by the Department of Engineering Professional Development. The Engineering Outreach Program distributes videotapes and CD-ROMs to off-campus students. The website from which video files of class sessions are made available to off-campus students is maintained by Engineering Media Services.

MEPP and MEES—Upon entry to either program, students receive a Program Resource Guide that describes their new learning environment, orients them to the tools they will be using, and summarizes key University policies and resources. With this package, students also receive a, “Welcome to MEPP/MEEES” video that they are encouraged to view and share with family and co-workers.

An important part of the MEPP and MEES curricula is a one-credit course, Network Skills for Remote Learners. All students take this eight-week course in the summer before their first semester of classes. The course provides students with the technical and organizational tools to be successful distance learners. Students develop a personal learning plan, detailing how they will carve 10 to 20 hours per week from their already busy schedules for their MEPP/MEEES studies, and share those plans with their spouses, bosses, and each other. MEPP alumni have noted the importance and value of this initial course in helping them to feel comfortable and
confident in Web-based learning and in developing a successful learning plan for the next two years of their lives.

A hallmark of the MEPP/MEES program design is its serious commitment to providing proactive support to meeting the needs of adult, off-campus students. MEPP and MEES have a program-dedicated counselor/advisor, who anticipates problems and advocates on behalf of students. The distance degrees counselor helps resolve registration problems and tuition payments and bridges the gap between distance students and the UW-Madison campus. The counselor has been instrumental in developing critical working relationships with the Graduate School, libraries and other student services at the university.

5.3 Access for Individuals with Disabilities
College M.E. programs are committed to meet the needs of all students with disabilities. MEPP and MEES Web-based materials are designed to meet accessibility requirements and campus facilities used for residency are wheelchair-accessible.

5.4 Student Access
No difficulties.

5.5 Technical Support
Student support is provided by the Department of Engineering Professional Development (academic issues, curriculum planning), the Engineering Outreach Program (course enrollment, tape/CD-ROM distribution) and Engineering Media Services (website).

6. Finance

6.1 Program Cost
All options under the Master of Engineering degree charge uniform tuition. The tuition rate, which includes all fees for technology and Residency, approximates the UW-Madison graduate tuition for non-resident students.

6.2 Budget Requirements
None.

6.3 Capital Requirements
None.

7. GFEC Program Review

7.1 Quality/Diversity of Graduate Students
For each of the options, an admissions committee consisting of four faculty members, the program director, and the program counselor review all applications, and make admissions recommendations to the graduate school. Admissions criteria include:

- A BS degree from a program accredited by the Accreditation Board for Engineering and Technology (ABET) or the equivalent
• A minimum of four years' post-baccalaureate engineering experience (or registration by examination as a professional engineer)
• A minimum undergraduate grade-point average of 3.0 (on a 4.0 scale) for the equivalent of the last 60 semester hours (Applicants with less than a 3.0 may be admitted at the discretion of the department.)
• For applicants whose native language is not English, a minimum acceptable score of 580 on the written Test of English as a Foreign Language (TOEFL) or 243 on computer version
• For international applicants, a degree comparable to an approved US bachelor's degree

Diversity is addressed in section 4.2.

7.2 Funding
As this program is primarily a distance-degree program, with some on-campus options, tuition from the students is mostly returned to the College of Engineering to pay for the production and delivery costs of the programs. These programs are intended to be self-supporting when they are at or near their capacity.

7.3 Advising/Degree Committees
METJ--Prof. James Davis and Ms. Karen Al-Ashkar advise all students in the METJ option. A study plan is prepared for each student at the time of admission. This plan is revised annually. There is no thesis or final examination, but each student completes an individualized translation project as part of EPD 630 (Research in Japanese Technical Literature). Prof. Davis works with the student to identify a topic that is relevant to the student's job or career interests.

MEPP--Ms. Karen Al-Ashkar from Engineering Professional Development advises all students in the MEES option. There are no curriculum options. Satisfactory completion of all courses, and a minimum 3.0 GPA are required for graduation.

MEES--Ms. Karen Al-Ashkar from Engineering Professional Development advises all students in the MEES option. There are no curriculum options. Satisfactory completion of all courses, and the completion of an engine design project is required for graduation.

MEPEC--Professors. Osswald, Turng, and Giacomin advise all students in the MEPES option. A study plan is prepared for each student at the time of admission. This plan is revised annually. Professors work with each student to identify a topic that is relevant to the student's job or career interests.

MEEnergyS – Professors Klein, Nellis,a nd Rutland (all ME) advise students in this program.

7.4 Satisfactory Progress Guidelines
Most off-campus students take one course per semester over a period of three or four years. Most on-campus students take three or four courses per semester during one academic year. Job changes for off-campus students and limitations on the amount of tuition support that some companies will provide in one calendar year represent the most common reasons for students to take a leave of absence, thereby delaying their graduation. Some of these programs (MEPP,
MEES) have relatively strict progress requirements, as they operate on a ‘cohort’ model. The other programs do not use cohorts, so adherence to a curriculum chronology is not necessary. For those students, satisfactory progress is defined as for normal on-campus graduate programs.

MEPP and MEES--Students are expected to take a specific number of courses (two courses for MEPP, one course for MEES) each fall and spring semester, and one course each summer semester. Students progress as a cohort through the fixed-curriculum program. The Department of Engineering Professional Development grading policy is used.

7.5 Department or Program "Climate"
Off-campus students represent the overwhelming majority of students in the Master of Engineering program. Small class sizes for on-campus students provide greater opportunity to interact with faculty than is possible in many other graduate programs.

MEPP and MEES--The cohort learning model used by MEPP and MEES fosters the development of a strong, collaborative learning community. Online discussion tools used by the program enable and encourage frequent, meaningful dialogue among Class members and with instructors.

7.6 Professional Development
The Masters of Engineering program and its options support the efforts of faculty to continue to improve the effectiveness of their online teaching. Faculty meetings, typically held two to three times per year, typically include opportunities for faculty to share “lessons learned” with each other and to be briefed on new tools and best practices. Special faculty sessions have included training in making Web conferences more interactive and effective. The MEPP program has recently developed a video CD that features excerpts of faculty interviews, with reflections and suggestions from their experiences as online instructors. This has proven to be an effective orientation tool for new instructors in MEPP and other College distance degree programs.

8. Summary
The Masters of Engineering degree program is developing into a flexible approach for the College of Engineering to create and support a degree program which is interdisciplinary, aimed at practicing engineers, and is mostly delivered at a distance. The options themselves differ in subtle and not so subtle ways, reflecting the faculty’s views on the most effective ways to help students learn. The current topical areas (options) range from Technical Japanese, to Professional Practice to Engine Systems to Polymers. We anticipate that more options will become available as budget and faculty interests allow.

For those parts of the program that have been in existence for a while (METJ and MEPP), the feedback from students and employers has been very positive. As noted above, the MEPP program has won several awards as an outstanding distance program. The newer options can use the experience and success of the older ones as models to maintain the high standard set by METJ and MEPP.
PROPOSAL FOR AUTHORIZATION TO IMPLEMENT
A NEW ACADEMIC PROGRAM

1. PROGRAM IDENTIFICATION

In this document the College of Engineering at the University of Wisconsin-Madison proposes to initiate a Master of Engineering (MEng) program. This initiative will add a Master of Engineering degree to each existing major in the College, including the newly renamed Engineering major (formerly Engineering without designation). Hence this program will involve all departments in the College, either acting on their own or in conjunction with other departments in the case of interdisciplinary degrees. In some instances, other Colleges will also participate.

Because we seek approval of a structure for a series of degrees and options, rather than the degrees themselves, this document does not have all the detail of a typical “Format B.” In particular, funding, curriculum, and expected enrollment will vary from degree to degree, so we have not included details on these areas. We have received some information regarding enrollment in similar programs outside of Wisconsin and will discuss that in a later section. To facilitate the discussion, we will include information for one of the options (Polymer Engineering and Science) which we expect to begin soon, pending approval of this overall structure.

II. CONTEXT

The College of Engineering has offered Master's of Science degrees for decades. These have historically been research-oriented degrees, typically requiring a thesis. Increasingly, though, the Master's Degree in Engineering is becoming an entry level degree for students interested in preserving the widest possible options throughout their engineering careers. Employers desire students with focused study in specialized areas and it is difficult to supply students with those skills at the Bachelor's level, given other important needs such as to maintain breadth in the Liberal Arts and to thoroughly cover the fundamentals in math, computer science, chemistry, and physics. Hence, the College of Engineering would serve both students and employers well by providing specific programs focused on practice-oriented Master's degrees. In addition, "high tech" companies are finding that their employees require continuing education to keep up with the latest technology and maintain their competitiveness. To serve these needs, we are proposing to implement a series of Master's of Engineering degrees, which will be intended as specialized terminal degrees, following a Bachelor's degree in one of our traditional majors. The topics emphasized by these programs are expected to shift fairly rapidly as the relevant industrial practices evolve.
This program fits well with the University's plans for the future. In his recently published "A Vision for the Future," Chancellor Ward states that we must update the Wisconsin Idea by viewing the university as a partner with industry.

To do this, we must listen to and learn from the state's citizens, their elected officials, our alumni, and other friends. The communication revolution places us in the midst of a worldwide learning community. The challenge is to find new ways to originate, adapt, and transfer expertise from this global environment to the people of Wisconsin.

Planning for this program began as a result of desires expressed by Wisconsin industries and thus is an attempt to offer programs consistent with their needs and with our goals for academic excellence.

III. NEED

We are not aware of any comparable programs elsewhere in Wisconsin. There are Master's of Science programs in Engineering at UW-Milwaukee (UWM) and Marquette, and there are Bachelor's of Science programs at UW-Platteville, UWM and UW-Stout. No Wisconsin universities or colleges offer a Master's of Engineering.

Outside of Wisconsin, there are practice-oriented Master's of Engineering programs at the University of Michigan, Massachusetts Institute of Technology (MIT), Minnesota, Renssaeller Polytechnic Institute (RPI), North Carolina State, and elsewhere. These are all terminal degrees leading to professional practice of the discipline. The programs at RPI and NC State are given both on campus and at a distance. The others are strictly on campus degrees.

As mentioned above, technical industries within Wisconsin and in neighboring states have expressed a need for more advanced, practice-oriented training for engineers in order to maintain the technical competence of their work force. We propose to meet this need by creating a terminal graduate degree in engineering with a series of options available for advanced specialization that will prepare our students to work in this challenging environment. This degree program is designed to meet the needs of this changing environment with options focused on specific areas and with the ability to shift focus as industrial needs change. We currently have 3 proposals in hand for options under this program and faculty in the College have expressed an interest in approximately 6 other areas.

Demand for these programs will vary. Each option under the Master of Engineering program will have a different audience and thus the class sizes will differ. Typical programs will likely have on the order of 10-30 students in a graduating class, but this does not preclude the creation of larger programs. Some programs will consist largely of students who begin graduate study immediately after completing their undergraduate work, while others will consist largely of practicing engineers who study part time and work full time as practicing engineers. The focus of the various programs is expected to shift fairly rapidly as technologies and engineering practices evolve.
For comparison, the parallel program at the University of Michigan offers Master of Engineering degrees in 12 areas and these programs currently had an enrollment of 142 students in 1997. At that time, the largest program (Manufacturing) had 49 students and the smallest (Optical Engineering and Ultrafast Technology) had none. The program started in 1993 with 20 students and enrollment has increased each year, 48 students in 1994, 85 students in 1995, 108 in 1996, and 142 in the fall of 1997.

IV PROGRAM DESCRIPTION AND EVALUATION

The College proposes to add a Master of Engineering degree to all of its majors, including Engineering (formerly Engineering without designation). Initial proposals already prepared are for Master of Engineering degrees in Professional Practice, Technical Japanese, and Polymer Engineering and Science. Each option designed for this program will be customized for the discipline, but they must conform to a template created by the College. The proposed guidelines for all Master of Engineering degrees are:

- A Graduate Program Committee within the College will review proposals for new options and will administer the programs of the graduating students.
- The Graduate School will approve options as they are proposed by the College. The College will then be allowed to admit students directly to that program and students will not have to file individual programs with the Graduate School.
- Transcripts will reflect the degree designation, including the option. The diploma will reflect only the degree designation.
- These degrees should have a separate entry in the Graduate Catalog, alongside the other Engineering degrees.

The template for the MEngr degrees would be as follows:

- Degree requirements and admissions will be consistent with those in place for the MS degree.
- Students must take a minimum of 24 credits, with at least 12 taken in the College of Engineering.
- No more than 12 credits can be transferred from other universities or colleges.
- At least 9 credits must be 500-level or above.
- Students who do not have appropriate work experience in their chosen field must include at least 6 credits of engineering professional practice. The form of this requirement will vary from program to program, but will typically consist of projects carried out in conjunction with Wisconsin industry. The Graduate Program Committee will ensure the consistency of this requirement in collaboration with the program faculty.

A sample curriculum, taken from the soon-to-be-proposed Master of Engineering in Polymer Engineering and Science degree and option, is included as an attachment.

Students typically will be expected to complete their course requirements within two semesters of equivalent full-time study. Professional practice requirements often will be completed during the summer months, so a typical degree program will be completed in approximately 1 calendar year.
Faculty will carry out ongoing assessment of student learning using a variety of written and performance measures. Regular feedback will be solicited from students, graduates and employers to assist the faculty in assessing the overall success of the program.

V. PERSONNEL

Many faculty members will be involved in each of these programs. No new faculty positions are being requested and few new courses would be developed. It is expected that courses will be modified to reflect current practices as different Master of Engineering degree programs are developed. The College will create a Graduate Program Committee to oversee the creation and management of each of the Master of Engineering programs. No new academic or classified positions will be necessary. An office already administering MS degrees in the College will administer each program.

VI. ACADEMIC SUPPORT SERVICES

In general, no additional load will be placed on the library, computing, laboratory or audiovisual infrastructures already in place in the College. In some cases, programs provided via distance education will require assistance with the delivery technologies and with funding the delivery mechanisms. Those programs will have to procure such funding before they will be approved.

VII. FACILITIES – EQUIPMENT

Again, no significant equipment will be required for these courses. Proposed programs having such requirements must procure funding before the Graduate Program Committee will approve the program.

VIII. FINANCE

No funding is requested for these new programs. For on-campus MEqr degrees, we do not plan to create any new courses. Thus, there are no additional costs incurred as a result of the creation of the MEqr programs. We will have an increased enrollment in these courses, but the cost will be offset by the increased tuition.

For the options offered primarily at a distance, we do expect to incur costs associated with course development and delivery. In these cases, proposals for new programs will have to develop business plans and show mechanisms for supporting these costs before the program will be approved by the College Graduate Program Committee.

SUMMARY OF ESTIMATED ADDITIONAL AND TOTAL COSTS FOR PROPOSED PROGRAM

Estimated and additional cost tables for the proposed Master of Engineering Degree program are not included. As stated in section I, we are seeking approval of a structure for a series of degrees and options, rather than the degrees themselves. The unique structure
of this degree program, in which future degree options define the specifics of the curricula (as in the included example of the Polymer Engineering and Science degree option), means that the options developed will also determine additional and total costs. As described above in sections V through VIII, any options that do need additional resources will be required to be self-supporting and the College of Engineering is developing the committee structure necessary to oversee this requirement. Consistent with the requirement that options be self-supporting, the College of Engineering is not requesting any new funds, or the reallocation of any existing funds, to implement the Master of Engineering degree program.
Master of Engineering in Polymer Engineering and Science

Degree Requirements

1. Twenty four credits of Approved Polymer Engineering and Science Courses are required beyond the BS degree.
2. At least eighteen credits must be Formal Lecture or Laboratory Courses.
3. At least six credits must be Formal Lecture or Laboratory Courses numbered 600 or higher.
4. At least three credits must be Formal Lecture or Laboratory Courses numbered 700 or higher.
5. No more than six credits of Independent Study and no more than two (2) credits of Seminar are allowed.
6. No transfer credits are allowed.

Approved Polymer Engineering and Science Courses

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<tr>
<th>Chemical Engineering</th>
<th>Engineering Mechanics and Astronautics</th>
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<tbody>
<tr>
<td>Macromolecular Hydrodynamics</td>
<td>Intro to Finite Elements</td>
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<tr>
<td>Polymer Science and Technology</td>
<td>Composite Materials</td>
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<tr>
<td>Introduction to Colloid Science</td>
<td>Mechanics of Continua</td>
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<td>Polymerization Reaction Engineering</td>
<td>Independent Reading</td>
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<tr>
<td>Food Process Engineering</td>
<td>Linear Viscoelasticity and Plasticity</td>
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<tr>
<td>Intermediate Transport Phenomena</td>
<td>Advanced Topics in Finite Elements</td>
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<tr>
<td>Intermediate Problems in Chemical Engineering</td>
<td>Advanced Composite Materials</td>
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<tr>
<td>Advanced Chemical Engineering Thermodynamics</td>
<td>Intro. to Polymer Rheology</td>
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<tr>
<td>Physico-chemical Hydrodynamics</td>
<td>Structural Theories of Fluid Dynamics</td>
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<td>Structural Theories of Fluid Dynamics</td>
<td>Advanced Mechanics of Continua</td>
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<tr>
<td>Solid State of Macromolecules</td>
<td>Molecular Network Theories for Polymeric Materials</td>
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<tr>
<td>Advanced Problems in Chemical Engineering</td>
<td>General Tensor Analysis and Rheology</td>
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<tr>
<td>Seminar on Advances in Transport Phenomena</td>
<td>Rheology Research Seminar</td>
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<td>Rheology Research Seminar</td>
<td>Independent Work</td>
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<td>Polymer Materials Science Seminar</td>
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<td>Advanced Independent Studies</td>
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<tr>
<th>Chemistry</th>
<th>Mechanical Engineering</th>
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<tr>
<td>Chemical Instrumentation: Design and Control Applications</td>
<td>Intro. to Polymer Processing</td>
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<tr>
<td>Selected Topics in Polymer Characterization</td>
<td>Engineering Design with Polymers</td>
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<tr>
<td>Intro. to Macromolecular Chemistry</td>
<td>Composite Materials</td>
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<tr>
<td>Directed Study</td>
<td>Advanced Independent Study</td>
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<tr>
<td>Structural Theories of Fluid Dynamics</td>
<td>Advanced Composite Materials</td>
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<tr>
<td>Rheology of Macromolecules</td>
<td>Advanced Polymer Processing</td>
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<tr>
<td>Rheology Research Seminar</td>
<td>Modeling &amp; Simulation in Polymer Processing</td>
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<tr>
<td>Seminar: Macromolecular Chemistry</td>
<td>Intro. to Polymer Rheology</td>
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<tr>
<td>Research-Macromolecular Chemistry</td>
<td>Molecular Network Theories for Polymeric Materials</td>
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<td>General Tensor Analysis and Rheology</td>
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<td>Rheology Research Seminar</td>
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<td>Advanced Independent Study</td>
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Students typically will be expected to complete their course requirements within two semesters of equivalent full-time study. Professional practice requirements often will be completed during the summer months, so a typical degree program will be completed in approximately 1 calendar year.
September 12, 2007

(Via E-Mail Only)

To: Paul Peercy, Dean, College of Engineering  
From: Patrick Farrell, Provost  
Subject: Follow-up on the 2004-05 Joint Review of the Master of Engineering  
Copies: Steven Cramer, Associate Dean, College of Engineering  
Judith Kornblatt, Associate Dean, Graduate School  

Reply requested by November 15, 2007

The Master of Engineering was implemented in 1998 and underwent a joint review in 2004-05. The findings of the joint review, which are summarized in the attached memo, required a follow-up review in the fall of 2007. The purpose of this memo is to request that you proceed with that follow-up review.

The follow-up review is to be narrowly focused on the six questions listed in the attached memo. They focus on the oversight structure, assessment of student learning, and mechanisms for monitoring the program as it evolves. In order to complete this follow-up review in the 2007-08 academic year, please send me a report that addresses the six questions by November 15, 2007.

When I receive the report we will reconvene the joint review committee and ask them to consider the report. The new joint review committee will include as many members of the 2004-05 committee as are still available and willing to serve. We will add new members as necessary. The original members were Stephen Robinson (chair), Wayne Pferdehirt (program representative), John Strikwerda (GFEC representative, now retired), and Fran Garb (UW System Admin representative, now retired). Stephen Robinson, who chaired the original committee, is scheduled to retire at the end of the fall semester. It would be a great advantage to complete this review while he is still available so there will be continuity from the previous work.

When the review committee has completed its work, the report and recommendations of the joint review committee will be considered by the Graduate Faculty Executive Committee and then by the University Academic Planning Council. After that, I will send the report with my recommendation to UW System Administration. UW System Administration makes the final decision about the disposition of the review and continuation of the program.

If you have any questions please consult Jocelyn L. Milner (jmliner@wisc.edu, 263-5658) who will oversee this process. Also, please consult Jocelyn if you anticipate that the November 15 target date doesn’t provide enough time for the report to be prepared. Jocelyn can assist you if you need copies of any of the documentation from the 2004-2005 joint review or any additional information.

Attachment
May 12, 2005

TO:  Peter Spear, Provost and Vice Chancellor
     UW-Madison

FROM:  Ronald M. Singer
        Associate Vice President

RE:  Joint Review of the Master of Engineering

The University of Wisconsin Board of Regents authorized implementation of the Master of Engineering on March 6, 1998. The program was implemented in the Summer 1998 and underwent the required Joint Review in 2003-04. The Office of Academic and Student Services received your letter of recommendation based on the report of the Joint Review Committee on May 2, 2005. The committee reviewed the original program proposal, the program self study, letters from two outside reviewers, and a memo from the dean of the College of Engineering. Upon request, Associate Dean Patrick Farrell of the College of Engineering provided additional information.

The Joint Review Committee recommended that this program be continued at this time but that a final recommendation be delayed for three years. During that time, the oversight structure described in the original program proposal should be implemented. In Fall 2007, the joint review should be reactivated to focus specifically on the following six questions:

1. What structure has been established to “oversee the creation and management of each of the Master of Engineering programs” per the authorization of the ME degree? What evidence has been provided to show that this structure is actively ensuring quality within and across all Master of Engineering offerings?

2. What are the assessment criteria for the degree programs? Assessment should address practices for evaluating and continuously improving: (1) individual courses with each program; and (2) the curriculum, instructional design, and student support of each degree program.

3. What are the criteria for determining whether a degree program needs to be modified in light of changes in the instructional staff and external environment?

4. What are the criteria for determining whether to approve additional Master of Engineering degree programs or to discontinue a current program?

5. What are the criteria to detect whether a degree program has slipped or shifted from its intended purpose?

6. What has been done about the vulnerability of the Master of Engineering – Technical Japanese program?
I accept your report and recommendation. We will place the Master of Engineering program on the joint review schedule for Fall 2007, at which time a final focused review will take place.

I would like to thank all who participated in this review and to commend your faculty for the thorough review process. If you have questions regarding this action, please let me know.

cc: Cora B. Marrett, Senior Vice President for Academic Affairs
    John Wiley, Chancellor
    Sharon Wilhelm, Interim Associate Vice President, OPAR
    ACSS Program Planning Team

...\acis0405\msn engineering jnt review postponed.doc
April 28, 2005

To:   Ronald M. Singer, Associate Vice President for Academic Affairs  
       UW System Administration

From:   Peter D. Spear, Provost

Re:   Joint Review of the Master of Engineering

The University of Wisconsin-Madison portion of the joint review of the Master of Engineering is now complete.

The Master of Engineering degree program was designed and implemented as an umbrella degree for a series of distinct M. Engr. programs. Consequently, the review was of both the oversight structure for support of the degree and of the individual programs. The review committee found that, for the most part, individual programs, as exemplified by the Master of Engineering – Professional Practice, have made commendable progress and developed a strong academic foundation. The review committee did identify concerns about the Technical Japanese option and about assessment, which are described in their report. The review committee also found that the oversight structure that was originally proposed had not been established. The review committee deemed the implementation of this oversight structure to be essential to the ongoing success of all programs operating within the M. Engr. degree structure.

The reviewers have recommended that the current M. Engr. programs be continued for the present, that the oversight structure be implemented, and that the review be reactivated in fall 2007. The 2007 review would focus specifically on the following six questions:

1. What structure has been established to “oversee the creation and management of all of the Master of Engineering programs” per the authorization of the M. Engr. degree? What evidence has been provided to show that this structure is actively ensuring quality within and across all M.Engr. offerings?
2. What are the assessment criteria for the degree programs? Assessment should address practices for evaluating and continuously improving: (1) individual courses with each program; and (2) the curriculum, instructional design, and student support of each degree program.
3. What are the criteria for determining whether a degree program needs to be modified in light of changes in the instructional staff and external environment?
4. What are the criteria for determining whether to approve additional Master of Engineering degree programs or to discontinue a current program?
5. What are the criteria to detect whether a degree program has slipped or shifted from its intended purpose?
6. What has been done about the vulnerability of the Master of Engineering – Technical Japanese?

I forward this recommendation to you with the endorsement of the Graduate Faculty Executive Committee and the University Academic Planning Council.

The self study, the letters from the external reviewers, and the report of the program review committee are enclosed with this memo. If you have further questions or need additional documentation please contact me or Jocelyn Milner.

We are very grateful for the participation and guidance provided by Dr. Frances Garb who represented your office on the review committee.

Attachments

Copies: Paul Peercy, Dean, College of Engineering
        Pat Farrell, Associate Dean, College of Engineering
        Martin Cadwallader, Dean, Graduate School
        Jocelyn Milner, Director, Academic Planning and Analysis
To: Peter D Spear, Provost

From: Stephen Robinson, Professor of Industrial and Systems Engineering
Joint Review Committee Chair
Fran Garb, Senior Academic Planner, UW System
Wayne Pferdehirt, Director Engineering Distance Degree Programs
John Strikwerda, Professor of Computer Sciences

Subject: Joint Review for the Master of Engineering

This is the report of the Joint Review Committee appointed by your letter of September 3, 2004 and charged to review the Master of Engineering (ME) program and to report by December 15, 2004. In late November 2004 we notified you that because of complicating factors in the program the review could not be completed by December 15 but should be completed early in 2005.

Background

The committee met to discuss this unique program on November 9, 2004. Prior to that meeting, committee members reviewed the program self-study, a memo from the dean of the College of Engineering, the original program proposal and the executive summary of that document, and letters from two outside reviewers. During the meeting, the members of the committee reviewed the documents and clarified their charge. It became clear that we did not have sufficient information to address the issues included in your September 3, 2004 memo. The committee chair then requested additional information from Associate Dean Patrick V. Farrell of the College of Engineering, who provided this information in a memo dated December 17, 2004. The members of the committee reconvened on January 6, 2005 to discuss that additional information and to determine the substance of this report.

This program is more complex than most because of its unique structure. The Board of Regents authorized the College of Engineering to implement “a structure for a series of degrees and options, rather than the degrees and options themselves.” Degree and options would all conform to a template but could be customized for the discipline. Central to the program was the creation of “a Graduate Program Committee to oversee the creation and management of each of the Master of Engineering programs.” There are currently several
degree programs in various stages of implementation. We reviewed these degree options, and our comments on them follow. However, the Graduate Program Committee has not been formed and so it was not possible for us to review the structure of the program.

Findings

The self-study and external reviewers’ comments indicate that in the five years since initial approval of the ME degree, the College of Engineering has made commendable progress in developing new, “practice-focused interdisciplinary degrees,” each with a designated area of focus.

The three ME programs that are most advanced in their development are the ME in Professional Practice (MEPP), ME in Technical Japanese (METJ) and ME in Engine Systems (MEES). The current operations of these programs indicate that the College is meeting the goal of serving new student populations through its development of ME degrees. Students in these programs are mid-career professionals, who would be unlikely to interrupt their careers to move to Madison or any other UW campus. The practice-oriented curricula and the convenient distance format are enabling UW to effectively deliver innovative graduate education to new groups of adult students. The other two programs listed as “current options” in the self-study are the ME in Polymer Engineering and Science (MEPES) and ME in Energy Systems (MEnergyS), but these had been operating for less than one year as of the date of the self-study, and in our view neither of them had enough of an operational record to support the level of evaluation intended in a five-year degree review.

With one exception, the review committee has no serious concerns about the individual degree programs. The MEPP program is the most mature program developed thus far under the Master of Engineering umbrella. MEPP has achieved a strong record of academic excellence, evidenced by several major national and international awards for the program. In so doing, MEPP provides strong evidence that the ME degree can be and is being used to strategically advance the College’s and University’s role in delivering world-class education to adult students learning at a distance.

Most of the comments provided by external reviewers Dr. Frank Burris and Dr. Stuart Walesh focused on MEPP, the degree program with which reviewers were most familiar. Dr. Burris concluded: “There is little question in my mind that UW-Madison has made a creative contribution to the profession with MEPP. Its national standing in engineering will only be enhanced by the continued growth and success of MEPP and similar Master of Engineering programs.”

Our one area of concern with individual programs has to do with the vulnerability of the METJ program. This program is staffed by only one faculty member. A one-person faculty leaves the program and students’ studies inordinately susceptible to interruption. Also, the sole-faculty model substantially limits the program’s ability to expose students to a broad range of perspectives in their studies. Attention to this issue would strengthen the current and future viability of this program.
A second general area of concern is assessment. The assessment methods used by the individual degree programs need systematic review by the College to ensure thoroughness of assessment practices and an integration of lessons learned within and across all ME degree programs. The Committee reviewed assessment practices used by the MEPP program to assess courses, the overall program, and impacts on graduates’ careers. These practices appear thorough, and data that were provided showed how assessments are being used to improve the program. We understand that these practices are being adapted and applied to MEES as that program continues to develop. The Committee has not received sufficient information to review the effectiveness of evaluation practices employed in the METJ, MEPES and MEEnergyS degree programs, especially the portions of these programs that serve off-campus students. The nature of the programs and the charter under which they were developed indicates that they should be assessed more completely than is possible using only the standard course evaluation forms of the College of Engineering. In particular, there should be an overall assessment of the programs’ learning outcomes that is more than the sum of the individual course evaluations. The Committee has been provided no evidence that this is presently occurring.

Members of the review committee determined that the individual programs created under the ME umbrella, that have been operating for long enough to be evaluated, are for the most part doing well. However, the committee has a serious concern about the umbrella structure itself, which we explain next. Because of that concern, we recommend that final approval of this program be delayed.

The proposal to authorize the Master of Engineering program states that the approval is for “a structure for a series of degrees and options, rather than the degrees themselves.” It adds, “A Graduate Program Committee within the College will review proposals for new options and will administer the programs of the graduating students.” No such structure has been established: in particular, there is no Graduate Program Committee. Proposals for new degrees in the ME program have been reviewed by the College of Engineering Academic Planning Council, as they should be. The APC is, however, not an adequate management structure for the ME programs. Thus, without a structure to evaluate, the review committee was unable to fulfill its charge.

The proposal for the ME program states that “the topics emphasized by these programs are expected to shift fairly rapidly as the relevant industrial practices evolve.” If the ME program is to respond to the shifts whose existence motivated its establishment, it is imperative that there be some program oversight to assess which new degrees should be offered, which should be modified as conditions change, and which should be discontinued.

Because the existing ME degree programs are laudable, the review committee recommends that the program continue but that a final recommendation be delayed for three years. In the interim, the College needs to systematically review processes used to assess and improve all ME degrees to ensure appropriateness, thoroughness and effectiveness of those practices. In addition, the College of Engineering should use this
time to establish the management structure described in the authorization, including the Graduate Program Committee. This committee will oversee the several degree programs so that the ME program can fulfill its intended role. The College must establish this management structure quickly enough so that there is a record of program operation that can be evaluated three years from now (see below).

Our second recommendation is that this review be reactivated in the fall semester of 2007 to reexamine the management of the Master of Engineering program. The emphasis of that review should be on the management structure of the program and on how effectively that structure is working, rather than on the details of individual programs. We suggest that the review in Fall of 2007 should focus on the following questions.

1. What structure has been established to “oversee the creation and management of each of the Master of Engineering programs” per the authorization of the ME degree? What evidence has been provided to show that this structure is actively ensuring quality within and across all ME offerings?
2. What are the assessment criteria for the degree programs? Assessment should address practices for evaluating and continuously improving: (1) individual courses with each program; and (2) the curriculum, instructional design, and student support of each degree program.
3. What are the criteria for determining whether a degree program needs to be modified in light of changes in the instructional staff and external environment?
4. What are the criteria for determining whether to approve additional Master of Engineering degree programs or to discontinue a current ME program?
5. What are the criteria to detect whether a degree program has slipped or shifted from its intended purpose?
6. What has been done about the vulnerability of the METJ program?

Summary of recommendations

The review committee recommends:

1. That the established degree options within the ME program continue pending final approval following the 2007 review. Program-level assessment in the on-campus programs should be strengthened.
2. That the College of Engineering establish a management structure for the ME program, including the Graduate Program Committee described in the program authorization documents.
3. That this review be reactivated in the Fall semester of 2007 to reexamine the management of the ME program, focusing on the six questions stated in the previous paragraph.
May 13, 2004

Peter D. Spear, Provost
University of Wisconsin-Madison
150 Bascom Hall
Madison Campus

Dear Peter:

At its meeting on May 12, 2004, the College of Engineering Academic Planning Council unanimously approved the Five-Year Review report for the Master of Engineering degree. The Master of Engineering program offers degrees that are intended to be practice-focused interdisciplinary degrees which allow students to focus on an area of engineering practice that require courses and experience in a variety of engineering and non-engineering disciplines.

I support this recommendation and would ask that the proposal be submitted to the University Academic Planning Council at its earliest convenience. Enclosed with this letter is a brief overview of the degree option.

If you need additional information or have questions, please contact my office.

Sincerely,

Paul S. Peercy
Dean

PSP: cbb
Enclosure
1.1 Program Description and Context

1.1 Goals and Objectives
The Master of Engineering program offers degrees that are intended to be practice-focused interdisciplinary degrees. The program offers degrees with options to designate an area of specialization. These specializations allow students to focus on an area of engineering practice that will require courses and experience in a variety of engineering and possibly non-engineering disciplines. In contrast, current Masters of Science in Engineering degree programs usually seek depth in a specific field of engineering, rather than breadth across disciplines. Most of the options in the current Masters of Engineering program are available at a distance, and two of them (Engineering Practice and Engine Systems) are available only in a distance education format.

The current options available in this program are:
- Technical Japanese
- Polymer Engineering and Science
- Engineering Practice
- Engine Systems
- Energy Systems

A brief description of each of these options is provided below.

The Master of Engineering in Technical Japanese (METJ) option provides participants with the advanced skills and knowledge that are necessary to interact effectively with Japanese counterparts in the technical or business arena. At the basic or intermediate level the main focus is language instruction; at the advanced level the emphasis shifts to current problems and accomplishments in the spheres of Japanese economic activity and Japanese technology.

The Master of Engineering in Professional Practice (MEPP) option is designed to provide mid-career engineers with the skills, tools, and insights needed to be more effective as technical leaders of engineering projects and organizations. The degree program serves engineers from all disciplines and provides an effective alternative to an MBA or discipline-specific M.S.

The Master of Engineering in Engine Systems (MEES) option is targeted at working engineers in the automobile and internal combustion engine industries. The degree focuses on technical integration of the disciplines required in the design and development of internal combustion engines and vehicle powertrain systems. As such it emphasizes breadth within a specific industry, in contrast with the research depth of an on-campus Master of Science degree.

The Master of Engineering in Polymer Engineering and Science (MEPES) option prepares engineers and scientists for professional practice in the polymer industry. The degree draws on
the interdisciplinary nature of design, processing, and manufacturing with polymers. Graduates are typically employed by the plastics industry or by other polymer manufacturing businesses. This is the first graduate degree labeled Polymer Engineering and Science in the Big Ten.

The Master of Engineering in Energy Systems (MEEnergy) option provides candidates with an advanced education in energy fundamentals that include the principles of thermodynamics, heat transfer, and fluid mechanics. These disciplines and their associated conservation laws are the foundation of all energy systems analyses. They can be applied, along with optimization and economics, to effectively solve a wide variety of energy system and environmental problems.

The overall Masters of Engineering degree program has been in existence for 5 years, but the ages of the various options varies from almost 5 years (METJ) to less than one year (MEES and MEEnergyS). While the options focus on their separate technical areas, they share the overall interdisciplinary theme of the program, a target audience of working, off-campus (and in some cases, on-campus) students, and much of their support structure. For several of the following sections of this report, the individual options may be highlighted, as their contexts, needs, enrollments, and curricula do differ. For some sections (e.g. Academic Support Services), the options will be combined.

1.2 Context
The Technical Japanese Program has existed within the College of Engineering since 1982; a Certificate in Japanese Studies for Engineering Majors has been available to undergraduates since 1987. In 1990 the Technical Japanese Program began offering credit courses to engineers and managers in companies and government laboratories around the country, and a Certificate in Technical Japanese Studies for Professionals was introduced in 1993. Today, roughly half of the students enrolled in courses offered by the Technical Japanese Program are professionals, who participate via distance education technology. This METJ degree represents a credential that is attractive to professionals whose careers are linked to interactions with Japanese companies, Japanese technology and the Japanese market. The METJ option was first offered in 1999.

The MEPP (Masters of Engineering in Professional Practice) serves adult, working engineers, located across the world. These engineers would not have interrupted their careers to relocate to Madison to pursue graduate studies. As UW-Madison’s first completely Web-based degree, MEPP enables mid-career engineers living anywhere, to pursue a world-class graduate engineering degree without interrupting their careers or compromising work and family commitments. This option provides working engineers an opportunity to develop technical expertise in areas such as technical program management, engineering problem solving with computers, and international engineering while including communication, quality and business issues that many practicing engineers need to use. The technical focus distinguishes the degree from a business degree (MBA) while the interdisciplinary breadth is quite different from a traditional MS degree. The MEPP option was first offered in 1999.

MEES (Masters in Engineering in Engine Systems) is new within the Master of Engineering program, beginning in 2003. This program was developed to meet the specific needs of the internal combustion engine industry – an industry especially important to the economy of the state of Wisconsin, as many engine manufacturers and suppliers are located here. A unique
feature of the program is the perspective of a broad technical systems approach to the topic rather than focusing on the issues of a single discipline (like Mechanical Engineering). There are no similar programs at other universities that we are aware of.

The MEPES program is an outgrowth of a long history of work in polymers at UW-Madison. Polymer engineering activities at the University of Wisconsin-Madison date back to 1946 when Professor Ronald Daggett first included plastics in the mechanical engineering curriculum. To date, the group has grown to nine faculty members with a wide variety of expertise and research interests. The breadth and depth of research activities at the Polymer Engineering Center (PEC) and its sister Rheology Research Center (RRC) at UW-Madison have made them among the nation's strongest research groups in arenas of mechanical engineering, polymer engineering, and Rheology research. The MEPEC (Master of Engineering in Polymer Engineering and Science) opened in fall of 1998.

The MEEnergyS (Masters of Engineering in Energy Systems) option is very new within the Master of Engineering program, beginning in 2003. Energy systems utilize primary energy forms to accomplish desired tasks. From industrial applications to manufactured products to the transportation that allows mobility of people and goods throughout the world, energy systems are the common thread that transforms primary energy sources to accomplish useful work. Energy systems also play an increasingly important role in a number of environmental issues such as indoor and outdoor air quality, ozone depletion, and global warming. With growing recognition of our dependence on foreign oil (a finite primary energy source), the importance of advancing capabilities in energy systems and technologies has never been higher. ....

1.3 Need
METJ: Although the scope of technical cooperation between Japanese and American companies continues to increase, only two universities (University of Washington; UW-Madison) in the United States offer a degree with an emphasis on technical Japanese. Participation in the program at the University of Washington is limited to full-time students on the Seattle campus. Approximately 5-8 students enroll in this Master of Science in Engineering (Technical Japanese) program at the University of Washington each year. The METJ program at the UW-Madison thus represents a unique educational opportunity, in that professionals may participate while continuing full-time employment anywhere in the world.

MEPP: The curriculum of the MEPP degree program was developed directly in response to surveys of engineers and engineering employers. The draft curriculum was tested through follow-up surveys. The intentional problem-based instructional design of the program meets the learning interests of adults and the needs of practicing professionals. The Web-based format meets the reliability, mobility, and interactivity needs of mobile professionals, participating from wherever their travels take them.

MEES: Development of internal combustion engines requires the integration of skills from a wide variety of disciplines within mechanical engineering, and increasingly material science and electrical engineering. Market studies conducted prior to developing this degree confirmed that the industry has difficulty identifying engineers with the breadth of technical skills to effectively
lead engine development programs. The MEES option was developed specifically to address this industry need.

MEPES: According to the Society of the Plastics Industry, the plastics industry is the fourth-largest manufacturing industry in the United States, accounting for approximately $331 billion in annual shipments and more than 1.5 million direct employees nationwide. The plastics industry continually faces new customer demands, furious global competition, spiraling oil prices, and growing environmental concerns. Furthering polymer-engineering education has been a main goal of the members involved with the PEC. This Masters of Engineering degree can be achieved via either residential or outreach programs. That is, engineers can obtain the Masters of Engineering degree or the Certificate from UW-Madison while fulfilling commitments at work or at home.

MEEnergyS: Students in Mechanical Engineering obtain an education that includes the principles of thermodynamics, heat transfer, and fluid mechanics. These disciplines and their associated conservation laws are the foundation of all energy systems analyses. There is an increasing demand in industry for students who are well-grounded in the range of fundamentals and practice that impact energy development, distribution, and use. In the undergraduate curriculum, however, there is little opportunity to integrate these topics and others such as optimization and economics together so that they can be effectively used in applied studies of energy systems. Achieving improvements in energy systems technology will require engineers with advanced studies and experiences that extend beyond what can be provided within an undergraduate Mechanical Engineering curriculum. This is provided by the Masters of Engineering program in Energy Systems.

2. Personnel

2.1 Faculty
The faculty for the Masters in Engineering are drawn primarily from UW-Madison faculty and staff. In addition, some programs invite practitioners to participate in teaching courses. As might be expected, the faculty is drawn from many departments within and outside of the College of Engineering. Current faculty distributions will be described below for each of the options:

METI--The primary faculty member participating in this program is Professor James Davis of the Department of Engineering Professional Development. Professor Davis directs the program and currently teaches all of the courses.

MEPP--Program faculty include Engineering Physics, Industrial Engineering, Engineering Professional Development, and the School of Human Ecology.

MEES--Five faculty members are from the UW Department of Mechanical Engineering and two are from the Department of Engineering Professional Development.

MEPEC--The primary faculty members participating in this program are three faculty of the Department of Mechanical Engineering.
MEEnergyS – The faculty for this the program are Mechanical Engineering and Engineering Physics faculty with interests in the energy area.

2.2 Administrative Structure
To promote efficient operation and to reduce costs the various options available under the framework of the Master of Engineering degree share administrative resources to the greatest degree possible. On-campus students are provided administrative support through an existing department (EPD or ME).

Ms. Karen Al-Ashkar serves as the advisor for students in the METJ, MEPP and MEES options of the Master of Engineering degree. She is responsible for receiving and tracking student applications, advises students about courses and financial aid, and deals with all other student issues that might affect their continued participation in the program.

Helene Demont directs the Engineering Outreach Program, which serves degree and non-degree students who enroll in College of Engineering courses at a distance. She registers off-campus students, is responsible for distribution of videotapes and CD-ROM, and assists with marketing.

Robert Perras manages Engineering Media Services, which provides technical support for the studio and web facilities that are used to make the MEPES courses available to off-campus students.

Support for the College’s Web-based degree programs is provided through the Department of Engineering Professional Development, and coordinated by Wayne Pferdehirt, Director of Engineering Distance Degree Programs.

2.3 Adjunct/Part-time Faculty
The industry focus of this degree necessitates significant industrial experience in teaching some courses. A strong academic background and prior teaching experience are required for these roles. The different options in this degree use different adjunct faculty, and in some cases, use none.

METJ—none.

MEPP—currently, three (one an emeritus professor from UW-Milwaukee Business School, and two highly respected private engineering consultants).

MEES—currently one (from Harley-Davidson), two more are likely (from Diamler-Chrysler and General Electric).

MEPEC—none.

2.4 Training and Support:
Training and technical support services for all options are provided by Engineering Media Services and by the Department of Engineering Professional Development..
3. Students

3.1 Enrollment Trends

METJ—

Although no students were admitted during the implementation year (1999), a steady pattern of admission of new students and graduation of current students has emerged. A chart containing enrollment data follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>1999-2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuing students</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>New students admitted</td>
<td>0</td>
<td>14</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>Students who withdrew</td>
<td>0</td>
<td>6</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Total enrollment</td>
<td>0</td>
<td>8</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>Graduating students</td>
<td>0</td>
<td>4</td>
<td>3</td>
<td>2</td>
</tr>
</tbody>
</table>

Off-campus students represent 26 of the 33 students who were admitted, nine of the 11 students who graduated, ten of the 11 students who withdrew and eight of the 11 students who are currently active. Nine of the ten professionals who withdrew from the program did so because of changes in employment.

MEPP—

The MEPP program is designed to admit 30 students each year. Typically, the Admissions Committee offers admission to 32-35 students and actual admissions range from 29 to 32. Each admitted Class of students study together as a stable cohort, as they progress through the fixed, two-year curriculum. The number of students admitted to, continuing in, and graduated from the program to date are summarized below.

<table>
<thead>
<tr>
<th>Year</th>
<th>1999</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
</tr>
</thead>
<tbody>
<tr>
<td>New students admitted</td>
<td>24</td>
<td>31</td>
<td>29</td>
<td>29</td>
<td>32</td>
</tr>
<tr>
<td>Continuing students</td>
<td>23</td>
<td>32</td>
<td>29</td>
<td>29</td>
<td></td>
</tr>
<tr>
<td>Total Enrollment</td>
<td>54</td>
<td>61</td>
<td>58</td>
<td>61</td>
<td></td>
</tr>
<tr>
<td>Graduating students</td>
<td>22</td>
<td>30</td>
<td>30</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Students entering MEPP are required to have a B.S. from an ABET accredited engineering program. Several MEPP students have also had M.S.'s and M.B.A.'s. Two students to date had previously earned Ph.D.'s.
MEES---
Little data is yet available as only the pilot class has been admitted. One of these students lost employment and was forced to withdraw.

<table>
<thead>
<tr>
<th>Year</th>
<th>Pilot Class</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2003</td>
</tr>
<tr>
<td>New Students Admitted</td>
<td>13</td>
</tr>
<tr>
<td>Planned New Admissions</td>
<td>0</td>
</tr>
<tr>
<td>Students who withdrew</td>
<td>1</td>
</tr>
</tbody>
</table>

MEPEC---

MEEnergySystem---
No students have entered the program at this time.

3.2 Degree Recipients
As mentioned above, most of the participants in this program are professionals who are employed by corporations or the U.S. government.

METJ: Since employers provide tuition for their employees to participate in this program, it is not surprising that the nine professionals who have graduated to date remain employed by the organizations that supported them through the program.

MEPP: Surveys of the first three graduating classes have shown that by graduation, 53% of MEPP students had already achieved a promotion or significant salary increase that they significantly attributed to their participation in MEPP.

3.3 Projected Enrollment
METJ-- It is expected that total enrollment for the METJ option will stabilize at 13-15 students, with 4-5 new students entering and 4-5 students graduating each year. Students remain in the program for 3-4 years, and that number is not expected to change.

MEPP-- The MEPP option is designed to admit 30 students each year. Typical total enrollment for the two-year program is 60 students. MEPP’s success in filling incoming classes is expected to continue as the program continues to grow in reputation and number of alumni.

MEES-- The business plan for MEES calls for admitting 17 students each year.

MEPEC-- Projected enrollment has not yet been ascertained.

MEEnergyS-- Projected enrollment has not yet been ascertained.

4. Program Descriptions and Evaluation

4.1 Curriculum
METJ--A typical curriculum for a student in the METJ option follows:
<table>
<thead>
<tr>
<th>Term</th>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>fall</td>
<td>EPD 330</td>
<td>Basic Technical Japanese I</td>
<td>3 cr.</td>
</tr>
<tr>
<td>spring</td>
<td>EPD 332</td>
<td>Basic Technical Japanese II</td>
<td>3 cr.</td>
</tr>
<tr>
<td>fall</td>
<td>EPD 374</td>
<td>Intermediate Technical Japanese I</td>
<td>3 cr.</td>
</tr>
<tr>
<td>spring</td>
<td>EPD 375</td>
<td>Intermediate Technical Japanese II</td>
<td>3 cr.</td>
</tr>
<tr>
<td>fall</td>
<td>EPD 430</td>
<td>Japanese for Business and Industry</td>
<td>3 cr.</td>
</tr>
<tr>
<td>spring</td>
<td>EPD 530</td>
<td>Advanced Technical Japanese Seminar</td>
<td>3 cr.</td>
</tr>
<tr>
<td>fall</td>
<td>EPD 630</td>
<td>Research in Japanese Technical Literature*</td>
<td>3 cr.</td>
</tr>
<tr>
<td>spring</td>
<td>EPD 630</td>
<td>Research in Japanese Technical Literature*</td>
<td>3 cr.</td>
</tr>
</tbody>
</table>

*This course is repeatable for credit, since completely new material is introduced each semester.

MEPP—The curriculum consists of 26 credits, with no electives—all courses are required. All courses were developed specifically for students participating in the MEPP program. Course content and format were developed for the specific learning needs and interests of MEPP students—highly motivated adult learners with substantial professional experience in the practice of engineering, learning at a distance.

A summary of the MEPP curriculum follows:

Year 1 Summer
- EPD 378: Network Skills for Remote Learners (1 credit)
- Summer Residency late August, on campus

Year 1 Fall
- EPD 612: Technical Project Management (3 credits)
- EPD 611: Engineering Economic Analysis and Management (3 credits)

Year 1 Spring
- EPD 617: Communicating Technical Information (3 credits)
- EPD 348: Engineering Problem Solving with Computers (3 credits)

Year 2 Summer
- EPD 615: Independent Reading and Research in Applied Engineering (1 credit)
- Summer Residency; late August, on campus

Year 2 Fall
- EPD 613: International Engineering Strategies and Operations (3 credits)
- EPD 416: Engineering Applications of Statistics (3 credits)

Year 2 Spring
- EPD 518: Quality Engineering and Quality Management (3 credits)
- EPD 519: Engineering Business Data Communications (3 credits)

MEES—The curriculum consists of 27 credits, with no electives—all courses are required. Each course is being developed specifically for MEES, and specifically for web instruction. None of the courses have yet been approved. The planned courses are as follows:

- Network Skills (1 credit)
- Performance and Combustion in Engines (3 credits)
Engine Design I (3 credits)
Engine Application Project (2 credits)
Engine Fluid Dynamics (3 credits)
Engine Design II (3 credits)
Engine Systems and Control (3 credits)
Computer-Based Problem Solving in Engine Development (3 credits)
Analysis of Trends in Engines (3 credits)
Engine Project Management (3 credits)

MEPEC—A typical curriculum for a student in the MEPES option may consist of:
ME 417 Introduction to Polymer Processing
ME 418 Engineering Design with Polymers
ME 525 Macromolecular Hydrodynamics
ME 601 Introduction to Electromechanics of Continuous Media
ME 699 Advanced Independent Study
ME 708 Advanced Composite Materials
ME 717 Advanced Polymer Processing
ME 925 Rheology Research Seminar Twenty-four (24) credits of required polymer science courses are required beyond the BS degree.

- At least eighteen (18) credits must be formal lecture or laboratory courses.
- At least six (6) credits must be formal lecture or laboratory courses numbered 600 or higher.
- At least three (3) credits must be formal lecture or laboratory courses numbered 700 or higher.
- No more than six (6) credits of independent study and no more than two (2) credits of seminar are allowed.
- No transfer credits are allowed.

Weekly seminars on rheology and polymer engineering supplement the formal lecture courses.

MEEnergyS - The degree program is administered by the department of Mechanical Engineering. The candidate must be admitted into graduate studies in Mechanical Engineering in order to enroll in this program.

Twenty-six (26) credits of approved engineering courses are required beyond the B.S. degree. Approved courses include all formal graduate-level courses in the Engineering College that are documented in the Graduate School Catalog. Students must meet with an advisor or with the Director of the M.E. program to select their courses. A list of approved courses is provided on the MEEnergyS website (http://www.engr.wisc.edu/me/current/grad/mees.html)

A summary of degree requirement is as follow:

26 credits (2 semesters), consisting of:
18 formal lecture or laboratory courses
12 credits from approved course list
Note: M.S. thesis credits are not counted

4.2 Diversity
METJ—An understanding of Japanese culture is inherent in mastery of the Japanese language. Elements of Japanese culture and Japanese thought are incorporated into discussions of Japanese language and manner of expression in EPD 330, 332, 374 and 375. Japanese business practices are analyzed in EPD 430. The target population for students in the Master of Engineering program is practicing engineers in industry. Among the 33 students who have been admitted to the METJ option three students (approximately 10%) were minority students. Of these three students one person graduated, one person is expected to complete the program during the current year and one person withdrew. In that sense the minority student population has the same track record as the overall student population in the METJ option.

MEPP--Admission is open to engineers living or working anywhere in the world. To date, one engineer permanently living outside the U.S. (Mexico) has enrolled in the program. Approximately 7% of students admitted to MEPP have been foreign nationals living in the U.S. Approximately 11% of admitted MEPP students are female. MEPP was one of several Web-based programs featured in an article by the Society of Women Engineers, highlighting the attractiveness of this learning format to female engineers, especially those who are trying to pursue graduate studies while fulfilling the demands of parenting young children.

MEPP graduates have reported that one MEPP course in particular has helped them improve their abilities to understand and effectively work with people from other cultures. International Engineering Strategies and Operations explores the meaning of culture, significant differences among cultures, and ways to effectively work with colleagues, customers and suppliers from other cultures.

MEES--The program is intended to be attractive worldwide, and efforts will be made to recruit students from around the world. The pilot class of 13 includes one woman and two persons of color. One of the students is a Canadian citizen; the remaining 12 have U.S. citizenship.

MEPEC--Polymer Engineering and Rheology enjoys international support, and both faculty and students from many cultures and countries have come to Madison to be part of the program.

MEEnergyS – Admission is open to any candidates who qualify for an advanced degree in Mechanical Engineering.

4.3 Assessment
METJ--Students in all courses are provided with opportunities to evaluate the course and the instructor. Suggestions from students have been incorporated into revisions of the syllabus in EPD 374, 375, 430, 530 and 630.

MEPP—The program uses a rigorous evaluation system to regularly evaluate and improve individual courses and the overall program. Formal elements of the evaluation program include:
an end-of-semester evaluation of each course by students and the instructor (most courses also use one or more mid-semester evaluations); a detailed programmatic evaluation by students at graduation; and a program impact survey conducted 9-12 months after graduation that includes graduates, their supervisors, and family members.

In 2003 MEPP received funds from the UW-Madison Office of the Provost to review and improve its assessment processes. This study was conducted by Dr. Greg Kearsley, an internationally recognized expert in online instructional design and evaluation. Dr. Kearsley, while providing several recommendations for improvement, concluded, “After reviewing the results and methodology from many program evaluations, the main conclusion of this study is the current MEPP evaluation scheme is better than those employed in almost all other graduate programs at higher education institutions” (Kearsley, Greg, “Evaluation and Improvement of Post-Graduate Program Impact Assessment Methods for the MEPP and Related Engineering Distance Degree Programs,” September 2003).

Overall, the quality, impact and cost effectiveness of MEPP were externally evaluated by the University Continuing Education Association (UCEA) and the U.S. Distance Learning Association (USDLA). In 2002 UCEA selected MEPP for its top award for new continuing education programs, the Outstanding Program Award (Credit Category). MEPP also earned UCEA’s Distance Learning Community of Practice Program of Excellence Award. The award honors a distanced-delivered program that is innovative and exemplary in meeting the needs of students. UCEA judges said, “This Masters of Engineering in Professional Practice is as good as it gets as a model of the development, implementation, and maintenance of a distance education degree program.” In 2003 MEPP was selected by USDLA to receive its Excellence in Distance Learning Programming, its top award for distance degree programs.

MEES--Students in all courses are provided with opportunities to evaluate the course and the instructor. Suggestions from pilot students are being incorporated as new courses are developed.

MEPEC and MEEnergyS--Students in all courses are provided with opportunities to evaluate the course and the instructor.

4.4 Accreditation
Not applicable for any of the options.

4.5 Concerns
Faculty Support: It is vitally important that College and University administrators and policies reinforce the importance, value, and support for COE distance degree programs as these programs are all offered at a distance, some exclusively so. It is important that faculty and their departments see these responsibilities as part of the College’s core mission and not an “add-on”. It is critical that the College’s strategic plans, faculty evaluation processes, and staffing plans reinforce the key role of ME distance degree programs to the College’s efforts to improve its stature and national ranking.

Hiring: Current UW-Madison personnel classifications present a hindrance to hiring qualified staff for distance education programs. For example there are no classifications for instructional
designer or document manager, two key responsibilities in developing and delivering Web-based courses. The current system requires that clear position descriptions be rewritten to obfuscate details and allow use of an existing personnel classification category, making hiring unnecessarily complex, inefficient and long.

Financial Support for Non-Sponsored Students: The lack of available scholarship funds has left the program unable to assist highly qualified applicants unable to pay the entire cost of the programs themselves. This has limited the ability of MEPP, for example, to serve the needs of engineers working for governmental agencies in Wisconsin. Development of a scholarship fund to meet the needs of these engineers, their organizations and the constituencies they serve is highly desirable.

4.6 Third Party Vendors
None.

5. Academic Support Services

5.1 On-going Support
The Wendt Library provides support for electronic reserves and retrieval of requested references. UW-Extension supports several critical elements for some of the options’ instructional technology, including Web conferencing (via WisLine Web) and document management (via Extension’s DocuShare server). DoIT supports the course management server and software (WebCT). The College’s Engineering Media Services supports development of video materials, CD/DVD duplication and billing.

5.2 Additional Support
Marketing efforts are conducted by the Engineering Outreach Program and by the Department of Engineering Professional Development. The Engineering Outreach Program distributes videotapes and CD-ROMs to off-campus students. The website from which video files of class sessions are made available to off-campus students is maintained by Engineering Media Services.

MEPP and MEES—Upon entry to either program, students receive a Program Resource Guide that describes their new learning environment, orients them to the tools they will be using, and summarizes key University policies and resources. With this package, students also receive a, “Welcome to MEPP/MEES” video that they are encouraged to view and share with family and co-workers.

An important part of the MEPP and MEES curricula is a one-credit course, Network Skills for Remote Learners. All students take this eight-week course in the summer before their first semester of classes. The course provides students with the technical and organizational tools to be successful distance learners. Students develop a personal learning plan, detailing how they will carve 10 to 20 hours per week from their already busy schedules for their MEPP/MEES studies, and share those plans with their spouses, bosses, and each other. MEPP alumni have noted the importance and value of this initial course in helping them to feel comfortable and
confident in Web-based learning and in developing a successful learning plan for the next two years of their lives.

A hallmark of the MEPP/MEES program design is its serious commitment to providing proactive support to meeting the needs of adult, off-campus students. MEPP and MEES have a program-dedicated counselor/advisor, who anticipates problems and advocates on behalf of students. The distance degrees counselor helps resolve registration problems and tuition payments and bridges the gap between distance students and the UW-Madison campus. The counselor has been instrumental in developing critical working relationships with the Graduate School, libraries and other student services at the university.

5.3 Access for Individuals with Disabilities
College M.E. programs are committed to meet the needs of all students with disabilities. MEPP and MEES Web-based materials are designed to meet accessibility requirements and campus facilities used for residency are wheelchair-accessible.

5.4 Student Access
No difficulties.

5.5 Technical Support
Student support is provided by the Department of Engineering Professional Development (academic issues, curriculum planning), the Engineering Outreach Program (course enrollment, tape/CD-ROM distribution) and Engineering Media Services (website).

6. Finance

6.1 Program Cost
All options under the Master of Engineering degree charge uniform tuition. The tuition rate, which includes all fees for technology and Residency, approximates the UW-Madison graduate tuition for non-resident students.

6.2 Budget Requirements
None.

6.3 Capital Requirements
None.

7. GFEC Program Review

7.1 Quality/Diversity of Graduate Students
For each of the options, an admissions committee consisting of four faculty members, the program director, and the program counselor review all applications, and make admissions recommendations to the graduate school. Admissions criteria include:

- A BS degree from a program accredited by the Accreditation Board for Engineering and Technology (ABET) or the equivalent
• A minimum of four years' post-baccalaureate engineering experience (or registration by examination as a professional engineer)
• A minimum undergraduate grade-point average of 3.0 (on a 4.0 scale) for the equivalent of the last 60 semester hours (Applicants with less than a 3.0 may be admitted at the discretion of the department.)
• For applicants whose native language is not English, a minimum acceptable score of 580 on the written Test of English as a Foreign Language (TOEFL) or 243 on computer version
• For international applicants, a degree comparable to an approved US bachelor's degree

Diversity is addressed in section 4.2.

7.2 Funding
As this program is primarily a distance-degree program, with some on-campus options, tuition from the students is mostly returned to the College of Engineering to pay for the production and delivery costs of the programs. These programs are intended to be self-supporting when they are at or near their capacity.

7.3 Advising/Degree Committees
METJ--Prof. James Davis and Ms. Karen Al-Ashkar advise all students in the METJ option. A study plan is prepared for each student at the time of admission. This plan is revised annually. There is no thesis or final examination, but each student completes an individualized translation project as part of EPD 630 (Research in Japanese Technical Literature). Prof. Davis works with the student to identify a topic that is relevant to the student's job or career interests.

MEPP--Ms. Karen Al-Ashkar from Engineering Professional Development advises all students in the MEES option. There are no curriculum options. Satisfactory completion of all courses, and a minimum 3.0 GPA are required for graduation.

MEES--Ms. Karen Al-Ashkar from Engineering Professional Development advises all students in the MEES option. There are no curriculum options. Satisfactory completion of all courses, and the completion of an engine design project is required for graduation.

MEPEC--Professors. Osswald, Turm, and Giacomin advise all students in the MEPES option. A study plan is prepared for each student at the time of admission. This plan is revised annually. Professors work with each student to identify a topic that is relevant to the student's job or career interests.

MEEnergyS – Professors Klein, Nellis, and Rutland (all ME) advise students in this program.

7.4 Satisfactory Progress Guidelines
Most off-campus students take one course per semester over a period of three or four years. Most on-campus students take three or four courses per semester during one academic year. Job changes for off-campus students and limitations on the amount of tuition support that some companies will provide in one calendar year represent the most common reasons for students to take a leave of absence, thereby delaying their graduation. Some of these programs (MEPP,
MEES) have relatively strict progress requirements, as they operate on a ‘cohort’ model. The other programs do not use cohorts, so adherence to a curriculum chronology is not necessary. For those students, satisfactory progress is defined as for normal on-campus graduate programs.

MEPP and MEES—Students are expected to take a specific number of courses (two courses for MEPP, one course for MEES) each fall and spring semester, and one course each summer semester. Students progress as a cohort through the fixed-curriculum program. The Department of Engineering Professional Development grading policy is used.

7.5 Department or Program "Climate"
Off-campus students represent the overwhelming majority of students in the Master of Engineering program. Small class sizes for on-campus students provide greater opportunity to interact with faculty than is possible in many other graduate programs.

MEPP and MEES--The cohort learning model used by MEPP and MEES fosters the development of a strong, collaborative learning community. Online discussion tools used by the program enable and encourage frequent, meaningful dialogue among Class members and with instructors.

7.6 Professional Development
The Masters of Engineering program and its options support the efforts of faculty to continue to improve the effectiveness of their online teaching. Faculty meetings, typically held two to three times per year, typically include opportunities for faculty to share “lessons learned” with each other and to be briefed on new tools and best practices. Special faculty sessions have included training in making Web conferences more interactive and effective. The MEPP program has recently developed a video CD that features excerpts of faculty interviews, with reflections and suggestions from their experiences as online instructors. This has proven to be an effective orientation tool for new instructors in MEPP and other College distance degree programs.

8. Summary

The Masters of Engineering degree program is developing into a flexible approach for the College of Engineering to create and support a degree program which is interdisciplinary, aimed at practicing engineers, and is mostly delivered at a distance. The options themselves differ in subtle and not so subtle ways, reflecting the faculty’s views on the most effective ways to help students learn. The current topical areas (options) range from Technical Japanese, to Professional Practice to Engine Systems to Polymers. We anticipate that more options will become available as budget and faculty interests allow.

For those parts of the program that have been in existence for a while (METJ and MEPP), the feedback from students and employers has been very positive. As noted above, the MEPP program has won several awards as an outstanding distance program. The newer options can use the experience and success of the older ones as models to maintain the high standard set by METJ and MEPP.

End of Report
Colleagues:

As promised at our last meeting, I am forwarding a document that I had prepared for the Sloan Consortium's Effective Practices website, summarizing the evaluation processes we use as part of the MEPP program. The same course evaluation process is being used by the MEES program; end-of-program and post-program evaluation methods will be adapted from MEPP when the first MEES cohort graduates (2007).

FYI, I have also attached copies of the program-wide evaluations by the MEPP Class of 2004 (May 2004) and the latest alumni follow-up survey (Class of 2003; February 2004).

Please feel free to e-mail or call with any questions you might have.

Best regards,
Wayne

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608.265.2361

MEPP Sloan Assessment.pdf
mepp follow up study 03.pdf
Learning Effectiveness

Key Practice: Assessment

Practice: Integrated Assessment System for Courses, Overall Program and Post-Program Career Impacts

Institution: University of Wisconsin - Madison

Date: 08-16-2004

How this practice improves learning effectiveness:
An integrated system of evaluations is needed to continuously improve the design of individual courses and associated overall degree programs. A regular system of surveys, debriefing and planning of improvements supports the culture and practice of continuous improvement. This practice describes the system of evaluations and follow-up debriefings that has been developed and used by the University of Wisconsin-Madison Master of Engineering in Professional Practice (MEPP) program since 1999.

MEPP is a two-year interdisciplinary engineering master's degree program focused on engineering technical leadership. This web-based graduate program admits 30 full-time working engineers from across the U.S. each year; these students progress as a stable cohort through a fixed curriculum. The first cohort was admitted in 1999 and graduated in 2001; as of May 2004, 114 engineers have graduated from the program.

End-of-course evaluation form completed by students
At the conclusion of each course, students are requested to complete an on-line course evaluation. All evaluations are conducted online, anonymously, using an automated survey tool. A summary of the evaluation results is prepared by the program evaluator, who submits the report to the course faculty, instructional designer, course manager, and the program director. Results are also shared appropriate with other program staff, and are discussed by faculty at periodic program faculty meetings.

End-of-course evaluation by instructors
At the conclusion of each course, the course instructor(s) complete an instructor evaluation form. The questionnaire asks instructors about their perceptions of what went well during the course, and what could/should be improved. The questionnaire is e-mailed to the instructor who can add responses digitally or manually.
Completed questionnaires are then reviewed, along with student-completed evaluations, in a joint meeting that includes the course instructor(s), the instructional designer, and the course manager. As part of this meeting, the team identifies items to be improved and an action plan for accomplishing those changes prior to the next offering of the course.

**Occasional special evaluations**
As the need arises, special evaluations will be conducted to inform decisions affecting program design and operation. For example, over the past few years, special surveys of MEPP students have asked students about their use of the course management system tools, their hardware, operating systems, security system, ISP, and use of various orientation and help resources.

**Informal discussions with faculty, counselor and program director**
MEPP students typically visit their online classrooms, and participate in online discussions at least daily. These discussions are monitored daily by the program director, program counselor, and program IT support staff. Students are quick to point out problems and suggestions as part of these classroom forums. As problems are identified, they are resolved as soon as possible or noted for subsequent follow-up. At the end of the course, the messages describing problems are compiled and used as part of the end-of-course review by the instructional team.

**Graduate program evaluation**
Approximately one week before graduation, MEPP asks graduates to complete an evaluation of the overall program. This evaluation focuses on "big picture" issues that extend beyond any individual course. For example, students are asked to look retrospectively at each course, rate the value of each course, and to suggest any changes to the program curriculum. Students are also asked to identify the most important changes to themselves, and their abilities as a result of the program, and to identify strengths and weaknesses in the overall degree program. Results of this survey are compiled, compared with results from previous years, and shared with staff, faculty, and the advisory committee to identify target areas for continuous improvement efforts.

**Post-graduation program impact survey**
For the past three years, MEPP has also performed a program impact survey of alumni 6-9 months after graduation. This evaluation seeks to identify how the program has produced real changes in the abilities, attitudes and career opportunities of
gradians. Separate, complementary surveys are conducted of alumni, co-workers of alumni (names provided by alumni), and family members of alumni (names provided by alumni). The survey of alumni and co-workers asks, respectively, alumni and their co-workers to rate the alumnus' perceived improvements in 18 skill domains targeted by the program. The alumnus is also asked to note the most significant changes in his/her attitudes, abilities and opportunities. The survey of family members asks about changes to alumnus' life skills and attitudes, and asks about impacts of the students' studies on family life, and how we can better support students' families. Results from this survey are compiled, summarized, and discussed with faculty, staff, and the program's advisory committee.

Evidence (or plan to obtain evidence):
This set of coordinated evaluation tools has been employed in the MEPP program since 1999. An important emphasis with each evaluation is to seriously study results and use input to improve course design, instructional methods, and program curriculum. Students see that faculty and staff are serious about continuous improvement, observing real impacts from theirs and classmates' recommendations, and building their ownership of the continuous improvement process.

The following statistics show the impact of these continuous improvements upon ratings across all courses. For each parameter, the program-wide average is given for 2000 and 2003.

Instructor did a good job: 4.3 (2003), 4.1 (2000)
Workload was about right: 4.1 (2003), 3.7 (2000)
Discussion forums: 4.1 (2003), 3.7 (2000)
Course texts: 3.9 (2003), 4.1 (2000)
Study guides: 3.9 (2003), 3.6 (2000)
Got help whenever needed it: 4.3 (2003), 4.0 (2000)

A good example of how the evaluation process works relates to the evaluation of teleconferences. During a faculty meeting in 2000, teleconferences were identified as an improvement target, based on program-wide averages. Training was developed and offered to faculty, focusing on making teleconferences more interactive and student-centered. Faculty used many of the ideas presented in these sessions, and teleconference rating by students improved significantly.
Estimated costs associated with this practice:
The MEPP program is glad to share the survey instruments used for course evaluations, program evaluations, or the post-graduation program impact evaluation, with any educators to reduce costs and foster collegial exchange.

Costs for updating, administering, and analyzing results of the subject surveys follows:

Course evaluations: 1 hr. to update; 0.5 hr. to administer, 2.0 hr to review results, summarize and discuss follow-up actions with course faculty.

Program evaluations: 1 hr. to update; 0.5 hr. to administer, 2.0 hr to review results, summarize and discuss follow-up actions with program director, all faculty and staff, and with program advisory committee.

Program impact survey: 2 hr. to update 3 surveys (graduate, co-worker; and family member); 8.0 hr. to administer (Web-administered with e-mail and phone follow-up contacts), 3.0 hr to review results, summarize and discuss follow-up actions with program director and all faculty, and with program advisory committee.

Relation to other pillars:
Student satisfaction: The described evaluation system leads directly to improved student satisfaction, as evidenced by the above data.

Learning effectiveness: The system builds faculty satisfaction by providing an open, supportive environment for faculty to learn what is working, what can be improved, and identify practical ways to improve course design.

Cost effectiveness: The system builds cost effectiveness by providing assurances to students, their employers, faculty, and administrators, that all investments and money are effectively utilized.

Access: The system builds access by promptly identifying and addressing any accessibility problems experienced by students.

References, supporting documents:
Achtemeier, S., Morris, L. & Finnegan, C. (2003, Feb).

Considerations for developing evaluations of online courses. Journal Asynchronous Learning Networks, 7(1). Available at: http://www.aln.org/publications/jaln/v7n1/v7n1_achtemeier.asp


Useful links:

<table>
<thead>
<tr>
<th>URL/Web Address</th>
<th>Link Description</th>
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<tbody>
<tr>
<td><a href="http://mepp">http://mepp</a> engr. wisc.edu/</td>
<td>MEPP Program Information</td>
</tr>
</tbody>
</table>
http://mepp.engr.wisc.edu/quotemain. Student Quotes html
http://mepp.engr.wisc.edu/news/index. Awards and Articles html

Summary:
This practice outlines a system of planned evaluations that together firmly support a process of continuous improvement for a distance degree program at the University of Wisconsin - Madison. Key elements include: an evaluation of each course by students and faculty; an evaluation of the overall program at graduation; and a follow-up survey of alumni, their co-workers, and their family members to measure the impact of the program upon professional and personal development of alumni.

Other Comments:
MEPP is glad to share survey instruments with other educators.

Contact: Wayne Pferdehirt, Program Director, 608-265-2361, pferdehi@epd. engr.wisc.edu
MEPP 2004 Program Evaluation Summary

A summary report of responses to a program survey from the Class of 2004

Amy Shenot
June, 2004
This report summarizes responses to a program survey of the MEPP Class of 2004 conducted in May 2004. Upon program completion, 21 of 30 members of the class completed the survey, 48% are mechanical engineers, 19% are electrical engineers, and 19% are chemical engineers. (Respondents are asked their discipline to allow stratification of responses by discipline.)

**Curriculum**

With the exception of Business/Data Communications, all courses were rated as an essential part of the curriculum by over half of the respondents. A couple thought Independent Research was not important, and a handful thought Business/Data Communications was not important.

<table>
<thead>
<tr>
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<th></th>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Should not be part of MEPP curriculum</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Not particularly important</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Neutral</td>
<td>5%</td>
<td>5%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Important but not essential</td>
<td>19%</td>
<td>19%</td>
<td>5%</td>
<td>5%</td>
<td>5%</td>
<td>5%</td>
<td>5%</td>
<td>10%</td>
<td>15%</td>
<td>15%</td>
</tr>
<tr>
<td>Course is essential part of MEPP</td>
<td>75%</td>
<td>75%</td>
<td>10%</td>
<td>30%</td>
<td>30%</td>
<td>10%</td>
<td>10%</td>
<td>10%</td>
<td>80%</td>
<td>85%</td>
</tr>
</tbody>
</table>

The table and chart on the next page provide averages of the responses to this question from the Class of 2001 through the Class of 2004. It is important to note that all courses consistently receive high ratings and that for all but one course the averages have risen over the years; there is a downward trend for Business/Data Communication.
### Importance of MEPP Courses

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>4.00</td>
<td>4.26</td>
<td>4.47</td>
<td>4.26</td>
<td>4.00</td>
<td>3.79</td>
<td>3.68</td>
<td>4.53</td>
<td>4.47</td>
<td>3.74</td>
</tr>
<tr>
<td>2002</td>
<td>4.55</td>
<td>4.86</td>
<td>4.82</td>
<td>4.64</td>
<td>4.73</td>
<td>4.27</td>
<td>4.73</td>
<td>4.73</td>
<td>4.18</td>
<td>4.14</td>
</tr>
</tbody>
</table>
When asked what courses could be added to the curriculum, several mentioned management topics: management and leadership, managing and working with people, negotiation and conflict resolution, management techniques, managing teams, managing technical resources, modern operations management. Other suggestions include business law/ethics, marketing, and a course on contracts, liability, and intellectual property. To make room for these additions, most suggested less emphasis on Business/Data Communications and several recommended merging Business/Data Communications with Network Skills. A few respondents reminded us of the challenge to keep the curriculum fresh and evolving.

The same question was included in the Program Completion Surveys for the Class of 2002 and the Class of 2003. This table shows the topics graduates most often request when asked what could be added to the curriculum.

<table>
<thead>
<tr>
<th>Topic</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management (includes leadership, managing people and teams, operations management, and management skills such as negotiation, planning, decision-making)</td>
<td>5</td>
<td>2</td>
<td>5</td>
<td>12</td>
</tr>
<tr>
<td>Ethics / Law / Contracts / Intellectual Property</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Finance</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Marketing</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

The responses to a new question in this year’s program survey — “Reflect on your experience as a distance learner in a network with your cohort. Is there anything you’d change about the first course, Network Skills for Remote Learners, to better prepare a new MEPP student for successful program participation?” — echo what we heard in the most recent Network Skills evaluation about the importance of emphasizing teamwork and reinforce the value of recent revisions made to the course. The course now includes a lesson in which students coordinate a small-group webconference and practice uploading and working with slides, a few lessons devoted to student-generated Top 10 Lists for being a successful distance learner and virtual team member, and a stronger emphasis throughout the course on how to make meaningful contributions to discussion forums.

**Program Impacts**

The following charts depict the professional/career impacts of MEPP and to what extent the Class of 2004 believes their skills have improved as a result of MEPP.
What is the significance of MEPP to your professional/career development?

<table>
<thead>
<tr>
<th>Response</th>
<th>Number of Responses</th>
<th>Response Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>A little</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Some</td>
<td>4</td>
<td>19%</td>
</tr>
<tr>
<td>Considerable</td>
<td>10</td>
<td>48%</td>
</tr>
<tr>
<td>Extensive</td>
<td>7</td>
<td>33%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>21</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

6. To what extent have you acquired new skills as a result of MEPP?

<table>
<thead>
<tr>
<th>Response</th>
<th>Number of Responses</th>
<th>Response Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>A little</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Some</td>
<td>3</td>
<td>14%</td>
</tr>
<tr>
<td>Considerable</td>
<td>9</td>
<td>43%</td>
</tr>
<tr>
<td>Extensive</td>
<td>9</td>
<td>43%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>21</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

7. To what extent has your participation in MEPP resulted in increased salary or a promotion?

<table>
<thead>
<tr>
<th>Response</th>
<th>Number of Responses</th>
<th>Response Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>No Impact</td>
<td>11</td>
<td>52%</td>
</tr>
<tr>
<td>Probably</td>
<td>5</td>
<td>24%</td>
</tr>
<tr>
<td>Definitely</td>
<td>2</td>
<td>10%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>21</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

8. To what extent do you expect participation in MEPP to result in an increase in salary or promotion in the future?

<table>
<thead>
<tr>
<th>Response</th>
<th>Number of Responses</th>
<th>Response Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Impact</td>
<td>6</td>
<td>24%</td>
</tr>
<tr>
<td>May have some</td>
<td>6</td>
<td>26%</td>
</tr>
<tr>
<td>Will probably lead to a salary increase or promotion</td>
<td>9</td>
<td>43%</td>
</tr>
<tr>
<td>Will definitely lead to a salary increase or promotion</td>
<td>1</td>
<td>5%</td>
</tr>
</tbody>
</table>

When asked to identify the “most important changes to you or your abilities as a result of MEPP,” the changes noted most frequently are increased confidence in ability to take on new projects/responsibilities and improvements in communication skills and teamwork. Several noted the ability to use new tools, including web-based tools, and several others noted a broader understanding (e.g., financial and cultural) that will help them in the future.
**Strengths**

Program strengths most often noted are:

- The cohort model
  - Most mentioned learning from a diverse group of peers and advancing through the program in a cohort as one of the greatest strengths
- Work-based applications of learning and the curriculum
  - Many described the relevant course assignments as a great strength and some also mentioned the value of course work to their organizations

Other strengths noted by several respondents include the delivery methods and the faculty and staff.

**Weaknesses**

No consistent themes emerged. Several students noted disappointment with some courses and instructors; four specifically noted IRRAE (poor support from advisors or little value in the emphasis on research) and two mentioned CTI. Other program weaknesses that were noted include the difficulty of completing large course projects due to work schedules, the inherent challenges of learning at a distance (finicky technology, difficulty in reading emotions, stigma of online courses) and lack of name recognition for the degree.

**Instructional Technology**

A new question in this year’s survey solicited recommendations to improve the platform. Many stated the current mix of instructional technology works well or praised the MEPP instructional technologists. Six respondents noted some frustration with WebCT (especially the e-mail tool) and four noted difficulties using DocuShare. Ideas for improvement include hardware/software standards, a course system with a better email tool, and a file-management system that is easier to use and more reliable than DocuShare.

**Balance of Individual and Teamwork**

Responses to another new question in this year’s survey strongly indicate that the number and nature of team projects is appropriate and an important aspect of the learning environment; working effectively in teams is a key to success on the job. One person thought there were too many team projects and another thought there were too many team projects in the final semester.
Recommended Changes and Other Comments

The only program change recommended by more than one person is to reduce the cost or include books and residency expenses with tuition, for reimbursement. Most other recommended changes are course-specific and addressed in the course evaluations.

All but one additional comment generated from the last, open-ended question are expressions of gratitude and appreciation for the MEPP program, people, and experience. One person wanted to share more projects and see more classmates' projects.

Conclusions

The survey results do not point to any significant changes needed to the curriculum. However, the results may be used to fine-tune or complement the curriculum. For example, there are a variety of ways to add more educational and networking opportunities for those interested in pursuing management positions, including:

- A discussion forum could be added to MEPP Community, where past and present program participants could discuss real challenges in engineering management.
- In course projects, students most interested in improving their management skills could assume the role of project manager.
- A series of mini-courses on management, based on the needs and interests of students and employers, could be offered during residencies.
- Management could be a focus of educational opportunities we develop for alumni.

The feedback on the mix of assignments (balance of individual and teamwork) and the mix of instructional technologies (the program platform) indicates no significant changes are needed and reinforces the emphasis throughout the curriculum on teamwork. As we transition to a new course management system, we will revisit comments about the platform.

In sum, responses from the Class of 2004 are very positive and will guide our continuous improvement efforts.
FOR IMMEDIATE RELEASE
4/30/09

CONTACT: Sandra Ashford, ashford@epd.engr.wisc.edu, 608-890-2026

MASTER OF ENGINEERING IN ENGINE SYSTEMS RECEIVES DISTANCE-LEARNING AWARD

MADISON - The United States Distance Learning Association (USDLA) presented its 2009 International Distance Learning Award to the University of Wisconsin-Madison's Master of Engineering in Engine Systems (MEES) program in conjunction with the 2009 National Conference in St. Louis.

Since 1987, USDLA has been the world's premier distance-learning association. The USDLA International Awards program honored outstanding individuals and organizations for excellence in the field of distance learning, education and training.

These prestigious international awards are presented annually to organizations and individuals engaged in the development and delivery of distance-learning programs.

Sandra Ashford, UW-Madison MEES program director, says, "We are proud and honored to accept the 21st Century Best Practice award from USDLA. This prestigious recognition is a testament to the dedication of the MEES faculty, staff and students to the continual improvement of distance learning in higher education."

"As a premier organization for the entire distance learning profession, we are honoring the MEES program as a leader in the industry," says John G. Flores, CEO of USDLA. "MEES has raised the bar of excellence, and we are truly honored by the MEES program's contributions to the distance-learning industry."

The awards were created to acknowledge major accomplishments in distance learning and to highlight those distance-learning instructors, programs and professionals who have achieved and demonstrated extraordinary results through the use of online, videoconferencing, satellite and blended learning-delivery technologies.

Reggie Smith III, USDLA board member and chair of the awards committee, says, "We look forward to seeing how the MEES program will inspire the 2010 award entries as they are recognized in Distance Learning Today to 3.5 million readers and via their participation in National Distance Learning Week (http://www.ndlw.org), Nov. 9-13."

UW-Madison's master of engineering distance-degree programs offer a world-class degree via the Internet. MEES provides a unique blend of technical skills and advanced leadership abilities, taught by instructors from the Engine Research Center and some of the top engine companies in
the world. The program features a high level of collaboration and project-based learning that applies directly and immediately to student's real-life work. To learn more, visit http://mees. engr.wisc.edu.

The United States Distance Learning Association (USDLA) is a nonprofit association formed in 1987 and is located in Boston. USDLA promotes the development and application of distance learning for education and training and serves the needs of the distance learning community by providing advocacy, information, networking and opportunity. Distance learning and training constituencies served include pre-K-12 education, higher and continuing education, home-schooling as well as business, corporate, military, government and telehealth markets. The USDLA trademarked logo is the recognized worldwide symbol of dedicated professionals committed to the distance-learning industry. Visit http://www.usdla.org for more.

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