UMBC

interoffice

MEMORANDUM

DATE: May 24, 2016

TO: Rosemary Drohan

FROM: Antonio Moreira, Ph.D.
            Vice Provost for Academic Affairs

SUBJECT: Masters in Professional Studies: Technical Management

Attached please find the original proposal for the Masters in Professional Studies: Technical Management.   For the sake of expediency, I am also sending copies of this information simultaneously to the Faculty Senate, the Graduate Council and the Academic Planning and Budget Committee.   Please coordinate with Drs. Moffitt, Rutledge and Nicholas to obtain the endorsement from the shared governance process.

We look forward to receiving the Faculty Senate's review.

Thank you.

AM:slm
Attachment

Cc: Dr. Kimberly Moffitt, President, Faculty Senate
       Dr. Janet Rutledge, Vice Provost and Dean, The Graduate School
       Dr. Charles Nicholas, Chair, APB
       Dr. Julia Ross, Dean, College of Engineering and Information Technology
       Dr. Chris Steele, Interim Vice Provost, Division of Professional Studies
       Dr. Tom Moore, Director, Systems Engineering
       Ms. Beth Wells (w/o attachment)

Proposed New Academic Plan or Name Change to Existing Academic Plan

Required steps in the review and approval process for proposed new academic plans and name changes to existing academic plans vary depending upon a number of factors. The Provost's Office reviews each concept for a new academic plan or name change in light of UMBC campus governance procedures and USM/MHEC approval guidelines. As a result of this examination, the boxes checked on page 2 of this form reflect the steps that have been identified as required for review of the proposed new academic plan or name change of an existing academic plan shown below and attached.

Concept approved by the Program Concept Group: Date of PCG review: Date routing sheet sent:

MPS Technical Management   _3/7/16_   _3/10/16_

This routing form and process is designed to enable more effective and efficient tracking of documents throughout the review and approval steps, ultimately leading to more timely completion of the process. This is especially important because in many cases MHEC has strict "windows" during which proposals must be submitted.

Instructions:

1. Please do **not** detach this routing slip from the proposal.

2. Regarding the proposed program acronym, the department proposing the new academic plan is responsible to consult simultaneously by email with Pam Hawley in the Registrar's Office at mcinnis@umbc.edu and Michael Dillon in IRADS at midillon@umbc.edu. Please send the proposed program acronym, type (BA, BS, certificate, etc) and description. If you have no preferred acronym, you can send only the description and degree type; Pam and Michael will respond with an assigned acronym. After this consultation, insert the following below: (1) the proposed name of the new academic plan; (2) a formal description of the proposed new academic plan (up to 30 characters); (3) a short description of the proposed new academic plan (up to 10 characters); and (4) a proposed new 4-letter acronym for the proposed new academic plan.[1]

3. If a new program is proposed, please send an email to Miriam Tillman at mir@umbc.edu to inquire whether the Marketing Department in Institutional Advancement has an interest in exploring marketing opportunities associated with this program.

4. The proposal and these routing sheets should be sent to each office indicated on this form, in the order in which each appears on the list.

5. Attach letters of support from all participating departments, assuring capacity in courses, etc.

As you sign your approval (or return it to the prior step for modification), please email Susan Mocko in the Provost's Office at mocko@umbc.edu, giving the name of the proposal as shown above and the office to which you are sending it next, so that we can keep track of it. If you have questions about the review process, please contact Beth Wells at bwells@umbc.edu, x 58907. Thank you very much for your assistance.

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Proposed name of proposed new academic plan: Proposed program acronym:

Technical Management   _TECM (PrST MPS TECM TRK)_

Proposed formal description of new proposed academic plan (up to 30 characters):

Technical Management

Proposed short description of proposed new academic plan (up to 10 characters):

Tech. Mgmt.

<u>OR</u>

Proposed change to name of existing academic program: Current program acronym:[2]

Additional instructions for proposal: Beth Wells
Follow the instructions in the new program guidelines on the Provost's   Assistant Vice Provost for Academic Affairs
website for program type:

Follow the MHEC-approved template for MPS at UMBC.

[1] Note that academic plan acronyms are permanent and, once established do not change in the future if the name of the academic plan changes.

Name of proposed new academic plan or proposed change to name of existing academic plan:

MPS Technical Management

✓ Department proposing program <u>must submit the proposal for informal review</u> to the Vice-Provost for Academic Affairs, prior to submitting it for formal review.

✓ Department proposing program <u>must develop and get approval</u> for proposed acronym. _Follow instruction # 2 on Page 1._

✓ USM requires that proposals be submitted electronically. Please send an electronic copy of the FINAL version of your proposal to Susan Mocko at mocko@umbc.edu.

NA A _Letter of Intent_ is required for this program. The format and directions will be sent to you electronically.

Send to this office if checked here.	Signatures:	Dates:
✓	_Britt Wells_	5/2/16
	INFORMAL REVIEW	Date reviewed
	Assistant Vice-Provost for Academic Affairs	
✓	_[signature]_	5/2/16
	Department Chair GPD	Date approved
✓	_Lynne C Schaefer_	05/03/16
	Vice-President for Administration & Finance	Date budget reviewed
✓	_[signature]_	05/16/16
	Vice Provost, Professional Education	Date approved
NA		
	Dean of Natural & Mathematical Sciences	Date approved
NA		
	Dean of Arts, Humanities & Social Sciences	Date approved
NA		
	Dean of the Erickson School	Date approved
✓	_[signature]_	5/9/16
	Dean of Engineering & IT	Date approved
NA		
	Dean of Undergraduate Education	Date approved
✓	_[signature]_	5/11/16
	Dean of Graduate Education	Date approved
✓	Please return proposal & cover sheet at this point to: Vice Provost for Academic Affairs	NA
		Date Letter of Intent sent to USM
NA		
	Chair, Undergraduate Council	Date approved
✓		
	Chair, Graduate Council	Date approved
✓		
	Chair, Academic Planning & Budget	Date approved
✓		
	President, Faculty Senate	Date approved
✓	Please return proposal & cover sheet at this point to: Vice Provost for Academic Affairs	
✓		
	Provost	Date approved
✓		
	President	Date approved
✓	University System of Maryland/ Board of Regents _for information_ and Maryland Higher Education Commission for _____	
NA		
NA	_Target_ MHEC Window submission date (subject to change) _____	

Program Concept for a new M.P.S Track
April 2016

Proposed Name: M.P.S. Technical Management
**Sponsoring Department**: Professional Studies

Target Audience. The degree is targeted at technical professionals that are transitioning into leadership positions and want to learn leadership skills without needing additional graduate education in a technical discipline.

Educational Objectives. The goal of program is to provide students with skills and critical analysis capabilities to lead technical organizations and development teams. The specific student learning outcomes are as follows:

I.   Students will demonstrate the ability to use management, leadership, and interpersonal skills to lead technical teams & organizations.

II. Students will demonstrate the ability to make sound decisions using technical, strategic business, and ethical factors.

III. Students will develop additional technical management depth in project management, entrepreneurship, systems engineering, or leading technical organizations.

Need Statement. Traditionally leaders of technical organizations have been chosen from within organizations based on their technical knowledge. Recently there has been recognition within industry that leadership skills are equally, if not more valuable, than technical skills for employees in management roles.

The M.S. in Engineering Management program was created in 1987 as a program that allowed students with engineering degrees to *add more depth to their area of expertise*, and broaden their knowledge of management. Once seen as a keystone of the M.S. Engineering Management degree, the requirement for four technical courses now is contrary to current orthodoxy, and provides a barrier to entry for many qualified professionals seeking an education in technical management. The proposed MPS in Technical Management lowers the technical barrier, and aligns with the requirements of the current job market, for students wanting to study management of technical organizations. The figure shows the relationship between various degrees.
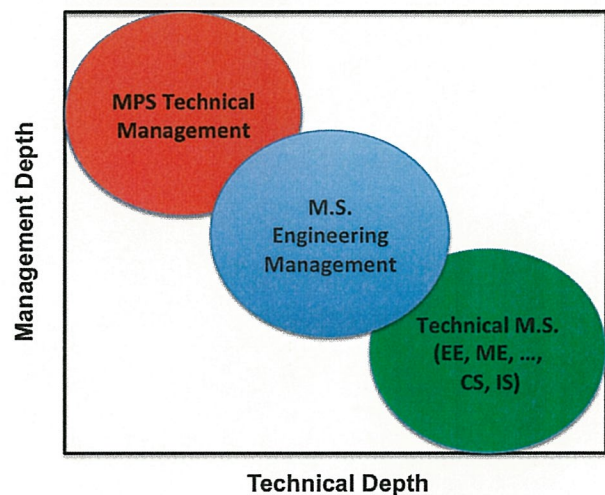
Supporting the hypothesis that students and employers are more interested in management skills is a 2013 Education Advisory Board (EAB) report on Engineering Management programs[1]. The quote below summarizes the findings,

> "Engineering *management program administrators have not observed nor received feedback from employers that their program graduates are insufficiently trained in engineering subjects. ... Instead, most students have been or want to be promoted into management, but lack appropriate training.*" [1]

The sentiment described in [1] is further supported by comments made at the 2012 UMBC Engineering Management Industrial Advisory Board. During the meeting some board members indicated their preference to send their employees to an engineering management program consisting of only management courses; knowing that they can send their employees for technical courses when needed.

Market. The 2013 EAB report [1] indicated a demand of 300 to 500 engineering management jobs in both Maryland and Virginia. UMBC currently has a MS in Engineering Management program with ~80 students that typically enrolls 20 to 30 new students a year. About half the students are international. In the past year the program has received ~10 inquiries from working technical professionals from non-engineering degrees, *e.g.*, biology and mathematics, seeking admission to Engineering Management program. The technical management

degree would serve these individuals and those students who are not strong in engineering. A survey of institutions in Maryland and Virginia indicates there are several offering Technology Management degrees and only a private institution offering a Technical Management degree. Johns Hopkins offers the Technical Management degree and reported granting 38 technical management degrees per the ASEE profiles. The JHU program is offered in person, on-line, and at local companies.

Proposed Curriculum. The proposed curriculum follows the prescribed rules for a M.P.S degree and builds off the existing courses within the Engineering Management program. Table 1 lists the proposed courses. The only new course is the capstone course. The capstone course would be designed to require students to demonstrate knowledge in management of technical teams, leadership, and effective communication by writing a 25 – 35 page case study of a technical management problem of interest and approved by the faculty. The student would also lead the class in analyzing the case study.

The required core courses overlap with the Post Baccalaureate Certificate in Engineering Management allowing students who obtains a certificate to choose either the M.S. in Engineering Management, or the M.P.S. with a Technical Management track for further graduate studies. The curriculum also supports students earning a Post Baccalaureate Certificate in Cyber Security in addition to the MPS in Technical Management.

Table 1: Proposed M.P.S. in Technical Management Track

Required Core Courses (18 credits)	Technically Focused Management Electives Choose 4 (12 credits)
Management, Leadership and Communication (ENMG 652)	Innovation and Technology Entrepreneurship (ENMG 690)
Leading Teams and Organizations (ENMG 654)	Principles of Organizational learning (ENMG 661)
Strategic Management (ENMG 659)	Leading Virtual/Global Teams (ENMG 661)
Decision and Risk Analysis (ENMG 672)	Financial Management (ENMG 658)
Engineering Law and Ethics (ENMG 656)	Project Management (ENMG 650)
Management Capstone (ENMG 693)	Project and Systems Engineering Management (ENMG 668)
	Advanced Project Management Applications (ENMG 663)
	Quality Engineering & Management (ENMG 664)
	Introduction to Systems Engineering (ENEE 660)
	Cybersecurity courses (CYBR 620, 621, 622, 623)
	Graduate Level Information Systems, Computer Science, or Engineering Course

Faculty Oversight. The Graduate Program Director for Engineering Management and Systems Engineering will provide day-to-day oversight of the program. The faculty teaching the courses will consists of adjunct faculty with significant industrial experience. Given the curriculum is using existing courses the current instructors are well versed in delivering the material.

Resources Needed. The program budget is shown on the next page. Only the estimated additional 3 classes above the existing Engineering Management courses needed to support the Technical Management track are included in the budget. The program director costs are pro-rated by the expected percentage of students in the Technical Management program. The majority of the program director costs are accounted for in the Engineering Management and Systems Engineering budgets. The proposed program does not need additional space given the courses are already being taught.

References
[1] J. Nelson, A. Thomas, "Aligning Engineering Management Curricula with Industry and Employer Need," Education Advisory Board, 2013

Enrollment Projections

Year	Total Enrolled Students	New Students	Returning Students	Current Students Changing from MS EM
1	10	5	0	5
2	17	7	10	0
3	19	12	7	0
4	25	13	12	0
5	29	16	13	0

Program Budget

PROJECTED ENROLLMENT AND TUITION REVENUE	Year 1	Year 2	Year 3	Year 4	Year 5
Enrolled Students	10	17	19	25	29
Projected Graduate Credits (assume avg 2 courses/semester/student)	120	204	228	300	348
Est. Graduate Tuition/Credit (w/o fees)	$ 585	$ 603	$ 621	$ 639	$ 658
TOTAL PROJECTED TUITION REVENUE	$ 70,200	$ 122,920	$ 141,503	$ 191,774	$ 229,131

PRELIMINARY PROGRAM EXPENSES: MPS Technical Management	Year 1	Year 2	Year 3	Year 4	Year 5
PERSONNEL (Costs raise @3% per year unless otherwise noted)					
Program Director Salary (x% based on TM /(SE+EM+TM) students)	$ 9,951	$ 16,486	$ 18,691	$ 24,230	$ 28,134
Program Director (33% Fringe)	$ 3,284	$ 5,440	$ 6,168	$ 7,996	$ 9,284
Part-Time Faculty (assumes need to add 3 classes per year above EM)	$ 18,540	$ 19,096	$ 19,669	$ 20,259	$ 20,867
Part-Time Faculty (7.5% Fringe)	$ 1,391	$ 1,432	$ 1,475	$ 1,519	$ 1,565
SUBTOTAL PERSONNEL EXPENDITURES	$ 33,166	$ 42,455	$ 46,003	$ 54,004	$ 59,851
OPERATING EXPENDITURES (costs raise at 3% per year unless noted) Only marginal costs above Eng. Mgmt. Listed					
Special & Technical (i.e. honorariums, student payments)	$ 2,500	$ 2,575	$ 2,652	$ 2,732	$ 2,814
Travel	$ 1,000	$ 1,030	$ 1,061	$ 1,093	$ 1,126
Contractual Services (i.e. Marketing, website, printing, equipment)	$ 6,000	$ 6,180	$ 6,365	$ 6,556	$ 6,753
Supplies (i.e. office, research items less than $1000)	$ 1,000	$ 1,030	$ 1,061	$ 1,093	$ 1,126
Equipment Capital or Sensitive (incl AOK library)	$ 1,000	$ 1,030	$ 1,061	$ 1,093	$ 1,126
Fixed Charges (Association dues, subscriptions, rental charges)	$ 1,000	$ 1,030	$ 1,061	$ 1,093	$ 1,126
SUBTOTAL OPERATING EXPENDITURES (Marketing & Supplies)	$ 12,500	$ 12,875	$ 13,261	$ 13,659	$ 14,069
TOTAL DIRECT EXPENDITURES	$ 45,666	$ 55,330	$ 59,265	$ 67,663	$ 73,919
INDIRECT EXPENDITURES					
UMBC ADMINISTRATIVE INDIRECT (10% of GROSS REVENUE)	$ 7,020	$ 12,292	$ 14,150	$ 19,177	$ 22,913
DPS ADMINISTRATIVE INDIRECT (15% of GROSS REVENUE)	$ 10,530	$ 18,438	$ 21,225	$ 28,766	$ 34,370
TOTAL INDIRECT EXPENDITURES	$ 17,550	$ 30,730	$ 35,376	$ 47,943	$ 57,283
TOTAL PROJECTED EXPENSES	$ 63,216	$ 86,060	$ 94,640	$ 115,607	$ 131,202
TOTAL PROJECTED REVENUE	$ 70,200	$ 122,920	$ 141,503	$ 191,774	$ 229,131
TOTAL PROJECTED NET +/- COST	$ 6,984	$ 36,860	$ 46,863	$ 76,167	$ 97,929