

Co-Terminal Degree Proposal, Form 802 Attachment

Bachelor of Science in Materials Engineering

Master of Engineering Management

Undergraduate Program

Undergraduate Program Type: Bachelor of Science in Materials Engineering

Total Undergraduate Program Credit Hours (including shared credit): 127 hours

Program Description: The materials science and engineering program aims to develop an understanding of the structure, properties, processing, and service behavior of engineering materials, including metallic, ceramic, polymeric, and composite materials. This understanding fosters both development of new materials and improvement of existing materials in order to optimize manufactured products. Laboratory experience is an important part of the program and emphasizes microstructural characterization using modern analytical techniques, such as optical and electron microscopy and x-ray diffraction, materials processing, determination of the physical and mechanical behavior of materials, and materials and process selection. Graduating students find employment opportunities in a wide range of industries requiring knowledge of materials development and/or optimization, processing, and selection.

Program Purpose: The co-terminal program between the BS in Materials Engineering (MSE) and Master of Engineering Management (MEM) allows students interested in future careers in engineering management to enter the job force very competitively positioned to pursue management opportunities within engineering-based industries.

Program Benefits: The Master of Engineering Management degree was one of six new interdisciplinary engineering degrees approved for Fall 2017. These interdisciplinary degrees reflect contemporary shifts in engineering education and increase the attractiveness of IIT with potential graduate students. By offering these new interdisciplinary graduate degrees as co-terminal programs with our current undergraduate degrees, we are providing our current undergraduate engineering students a path to greater competitiveness while they retain undergraduate financial aid benefits. Furthermore, engineering transfer students often face significant course sequencing challenges within engineering curriculums. Some transfer students solve this problem by pursuing co-terminal programs, and some choose to leave IIT. This co-terminal program will increase the options available to transfer students and potentially improve retention.

Course requirements and sample curriculum: Course requirements and a sample curriculum are included in this document.

Competitive Programs: BS MSE is a competitive degree offered by many institutions. However, most schools do not offer a co-terminal BS MSE and engineering management.

Market Analysis: BS MSE is a competitive degree offered by many institutions. The Master of Engineering Management is a new degree program (Fall 2017). Please refer to the market analysis for the MEM degree provided in the 2017 degree program application for further information.

Marketing and Advertising: Both degrees are currently marketed. The co-terminal degree will be included in current co-terminal degree marketing and additional marketing by the Armour College of Engineering.

Enrollment Estimates: Estimated enrollment in this co-terminal program is 0-2 new students/year.

Retention Estimates: It is anticipated that retention may be improved for transfer students as the co-terminal program allows more flexibility for scheduling each semester.

Economic Analysis: There are no additional costs for the co-terminal program. It is expected that this co-terminal program will draw from a group of students separate from those who pursue the other MSE co-terminal programs. Therefore, it is expected that additional tuition revenue will be generated equivalent to 24 credits/student enrolled in the program.

Graduate Program

Graduate Program: Master of Engineering Management

Program Overview: The Master of Engineering Management degree program provides an accelerated pathway to management positions within engineering-based industries for new engineering graduates and practicing engineers. There are two tracks: Project Management (PM) and Product Design & Development (PDD).

Program Justification: The Armour College of Engineering is committed to be a lifelong educational partner with our community, from pre-college to professional advancement. The MEM degree program contributes to this commitment by enhancing the overall offerings within the Armour College of Engineering. It is anticipated that approximately 20 students will enroll in the MEM program Fall 2018. The co-terminal degree is anticipated to add 0-2 additional students. A detailed justification for the MEM program can be found in the 2017 MEM degree application.

Program Resources: The co-terminal program does not require additional resources. The MEM curriculum includes existing courses and a few new courses that will be developed and delivered by adjunct professors employed as engineering managers industry, with full-time faculty oversight.

Program description: A detailed list of courses required for each track in the co-terminal degree follows. Students should have a 3.0 GPA in order to be accepted into the co-terminal program. Students will be accepted into the program beginning Fall 2018.

Description of courses shared between Undergraduate and Graduate programs:

a) Shared required courses:

UG: (2) MMAE courses as GRAD: (2) Engineering Electives

Any 4xx and/or 5xx MMAE courses (required or electives) that count toward the student's UG degree requirements, up to 6 hours

b) Shared elective courses: None

c) Course substitutions or exceptions: None

Bachelor of Science in Materials Engineering

Required Courses	Credit Hours		
	<i>UG</i>	<i>grad</i>	<i>total</i>
Materials Engineering Core Requirements^b MMAE 100, 200, 202, 232, 320, 365, 370, 372, 373, 463, 465, 470, 472, 476, 485	46	6	46
Master of Engineering Management Core Requirements EMGT 470, CAE 574/ENGR 574, CAE 575/ENGR 575, ENGR 510, ENGR 597, Engineering electives^b (6 cr)	0	15	15
<i>Project Management Specialization^a (select 9 cr)</i> <i>ENGR 520, ENGR 521, CAE 473/ENGR 573, CAE 421/ENGR 521, CAE 572/ENGR 572,</i> <i>MBA 523, INTM 511</i>	0	9	9
<i>Product Design & Development Specialization^a (select 9 cr)</i> <i>ENGR 595, BUS 472, MMAE 589, CHE 506, IDN 597, ENGR/BME 502, MMAE 560, CAE 523</i>	0	9	9
Material Science Requirement MS 201	3	0	3
Physics Requirements PHYS 123, 221, 224	11	0	11
Chemistry Requirements CHEM 124	4	0	4
Computer Science Requirements CS 104	2	0	2
Technical Elective	9	0	9
Free Elective	3	0	3
Engineering Elective	3	0	3
Mathematics Requirements MATH 151, MATH 152, MATH 251, MATH 252	18	0	18
Humanities and Social Science Requirements	21	0	21
I PRO	6	0	6
Total	126	30	126
(126 MSE UG) + 30 (MEM) -6 (shared credits) = 150 (total)			

^aOnly one track is required for the MEM program

^bshared courses between undergraduate and graduate curricula (6 cr)

Any 400 and/or 500 MMAE courses (required or electives) that count toward the student's UG degree requirements, up to six credits, will count as equivalent engineering elective credit for the graduate degree

Sample Schedule

Semester 1	Credits	Semester 2	Credits
MMAE 100	3	MS 201	3
MATH 151	5	MATH 152	5
CHEM 124	4	PHYS 123	4
Humanities 200- level	3	CS 104	2
		Social Science Elective	3
Total	15	Total	17
Semester 3	Credits	Semester 4	Credits
MMAE 200	3	MMAE 202	3
MMAE 232	3	MATH 252	4
MATH 251	4	PHYS 224	3
PHYS 221	4	Humanities Elective (300+)	3
Hum/SS Elective	3	Free Elective	3
Total	17	Total	16
Semester 5	Credits	Semester 6	Credits
MMAE 320	3	MMAE 372	3
MMAE 365	3	MMAE 463	3
MMAE 370	3	MMAE 465	3
MMAE 373	4	Technical Elective	3
Social Science Elective (300+)	3	Humanities Elective (300+)	3
Total	16	Total	15
Semester 7		Semester 8	
MMAE 470	3	MMAE 472	3
MMAE 476	3	Technical Elective	3
MMAE 485	3	PM or PDD Elective	3
EMGT 470 Project Management	3	PM or PDD Elective	3
ENGR 574 Economic Decision Analysis	3		
Total	15	Total	12
Semester 9		Semester 10	
Technical Elective	3	IPRO Elective II	3
IPRO Elective I	3	Engineering Elective	3
ENGR 575 Systems Analysis in Engineering	3	ENGR 510 Strategic Engineering Management	3
PM or PDD Elective	3	ENGR 597 Engineering Management Capstone	3
		Social Science Elective (300+)	3
Total	12	Total	15