Date Submitted: 10/20/23 3:33 pm

Viewing: BS-MSE: Bachelor of Science in Materials Science and

Engineering

Last approved: 12/18/21 11:53 am

Last edit: 10/20/23 3:33 pm

Changes proposed by: vural

Catalog Pages Using this Program Bachelor of Science in Materials Science and Engineering

Program Status Active

Requestor Name Murat Vural E-mail vural@iit.edu

2023-10-20 2021-12- Origination Date

Is this an

Nο

interdisciplinary program?

Program Title

Academic Level

Academic Unit Mechl, Materials & Arspc Engrg

College

Armour College of Engineering

Effective Academic

2024 2022 - 2025

Effective Term

Bachelor of Science in Materials Science and Engineering

Fall 2024

Year

Undergraduate

Program Type

Degree

Degree Type Bachelor of Science (BS)

CIP Code 14.1801 - Materials Engineering.

Is there more than one Academic Unit proposer?

No

Program Code BS-MSE

Program Attribute

Total Program

Credit Hours

126

Please provide a summary and rationale for the requested program revision.

MMAE 470 "Introduction to Polymer Science" has been removed from the required courses list in Materials Science and Engineering (MSE) program and replaced with a "Technical Elective" requirement. Therefore, total credit hour requirement of the program remains the same at 126 credit hours.

This revision is driven by the fact that "Polymers" are already covered in other required courses such as MMAE 372 "Aerospace Materials Lab" and MMAE 472 "Advanced Aerospace Materials" in MSE program. This change will bring more flexibility for students in choosing tech electives in their area of interest. See the attach-MMAE Department.pdf".

Program Narrative and Justification

In Workflow

- 1. MMAE Chair
- 2. Academic Affairs
- 3. Undergraduate **Academic Affairs**
- 4. AC Dean
- 5. Undergraduate Studies Committee
- 6. Faculty Council Chair
- 7. Academic Affairs

Approval Path

- 1. 10/20/23 3:14 pm Louis Cattafesta III (Icattafestaiii): Rollback to Initiator
- 2. 10/20/23 3:56 pm Louis Cattafesta III (Icattafestaiii): Approved for MMAE Chair
- 3. 10/20/23 4:32 pm Patty Johnson Winston (winston): Approved for Academic Affairs

History

- 1. Oct 18, 2017 by clmig-jwehrheim
- 2. Nov 8, 2017 by Sarah Pariseau (sparisea)
- 3. Apr 27, 2018 by Sarah Pariseau (sparisea)
- 4. Sep 14, 2020 by Patty Johnson Winston (winston)
- 5. Dec 18, 2021 by Murat Vural (vural)

Narrative description of how the institution determined the need for the program. For example, describe what need this program will address and how the institution became aware of that need. If the program is replacing a current program(s), identify the current program(s) that is being replaced by the new program(s) and provide details describing the benefits of the new program(s). If the program will be offered in connection with, or in response to, an initative by a governmental entity, provide details of that initiative

Narrative description of how the program was designed to meet local market needs, or for an online program, regional or national market needs. For example, indicate if Bureau of Labor Statistics data or State labor data systems information was used, and/or if State, regional, or local workforce agencies were consulted. Include how the course content, program length, academic level, admission requirements, and prerequisites were decided; including information received from potential employers about course content; and information regarding the target students and employers.

Narrative description of any wage analysis the institution may have performed, including any consideration of Bureau of Labor Statistics wage data related to the new program.

Narrative description of how the program was reviewed or approved by, or developed in conjunction with, one or more of the following: a) business advisory committees; b) program integrity boards; c) public or private oversight or regulatory agencies (not including the state licensing/authorization agency and accrediting agency); and d) businesses that would likely employ graduates of the program. For example, describe the steps taken to develop the program, identify when and with whom discussions were held, provide relevant details of any proposals or correspondence generated, and/or describe any process used to evaluate the program.

What are the enrollment estimates?

Year 1 Year 2 Year 3

Attach Additional BS-Aerospace Engineering and BS-Materials Science Engineering - UGSC Approval

Program Notes for AY2020-21 Bulletin.pdf

Justification Minor Curriculum Changes in the MMAE Department.pdf

Document(s)

Academic Information

Advising

Since quality advising is a key component of good retention, graduation, and career placement, how will students be mentored? What student professional organizations will be formed? How will the department work with the Career Services office to develop industry connections?

Program Resources

Which program resources are necessary to offer this program?

Proposed Bulletin Entry

Admission Requirements

Course Requirements

Required Courses

Materials Engineering Requirements		(43)
MMAE 100	Introduction to the Profession	3
MMAE 202	Mechanics of Solids	3
MMAE 232	Design for Innovation	3
MMAE 320	Thermodynamics	3
MMAE 350	Computational Mechanics	3
MMAE 365	Structure and Properties of Materials I	3
MMAE 370	Materials Laboratory I	3
MMAE 372	Aerospace Materials Lab	3
MMAE 373	Instrumentation and Measurements Laboratory	4
MMAE 463	Structure and Properties of Materials II	3

MMM6 ±170 Introduction to Folymer Science 3 MM6 ±172 Advanced Aerospace Materials 3 MMAE ±176 Materials Laboratory II 3 MME ±185 Manufacturing Processes 3 Materials Science Requirements (3) MS 201 Materials Science 3 MATH 151 Calculus I 0 MATH 152 Calculus II 5 MATH 152 Calculus II 5 MATH 152 Calculus II 4 MATH 252 Introduction to Differential Equations 4 MATH 252 Introduction to Differential Equations 4 Physics Requirements (10) Physics Requirements (4) Physics 224 General Physics III for Engineers 3 Chemistry Requirement (4) Chemistry Requirement (4) Chemistry Requirement (5) Chemistry Requirement (6) Chemistry Requirement (7) Chemistry Requirement (7) Chemistry Requirement (7)	MMAE 465	Electrical, Magnetic, and Optical Properties of Materials	3	
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Total Credit Hours 126	Select six credit hours		6	
	Total Credit Hours		126	

A technical elective is a 300- or higher-level course in any engineering discipline (other than required MMAE courses or their equivalent) or in mathematics, chemistry, physics, or computer science. However, not all such courses are acceptable as technical electives. Students should consult their faculty adviser for a determination of which courses are acceptable. In addition, ECE 218, ECON 423, INTM 437 and INTM 438 are permitted. Any substitutions require written approval by the department.

An engineering elective is a 300- or higher-level course in any engineering discipline (other than required MMAE courses or their equivalents).

Sample Curriculum/Program Requirements

Bachelor of Science in Materials Science and Engineering Curriculum

			Year 1
Semester 1	Credit HoursSemester 2		Credit Hours
MMAE 100	3	MS 201	3
MATH 151	5	MATH 152	5
CHEM 124	4	PHYS 123	4
Humanities 200-level Course	3	<u>CS 104</u>	2
		Social Sciences Elective	3
	15		17
			Year 2
Semester 1	Credit HoursSemester 2		Credit Hours

MMAE 202	3	MMAE 350	3
MMAE 232	3	MATH 252	4
MATH 251	4	PHYS 224	3
PHYS 221	4	Humanities Elective (300+)	3
Humanities or Social Sciences Elective	3	Free Elective	3
	17		16
			Year 3
Semester 1	Credit HoursSemester 2		Credit Hours
MMAE 320	3	MMAE 372	3
MMAE 365	3	MMAE 463	3
MMAE 370	3	MMAE 465	3
MMAE 373	4	Free Elective	3
Social Sciences Elective (300+)	3	Humanities Elective (300+)	3
	16		15
			Year 4
Semester 1	Credit HoursSemester 2		Credit Hours
MMAE 470	3	MMAE 472	3
MMAE 476	3	IPRO Elective II	3
MMAE 485	3	Technical Elective ¹	3
IPRO Elective I	3	Engineering Elective ²	3
Technical Elective ¹	3	Social Sciences Elective (300+)	3
<u>Technical Elective¹</u>	<u>3</u>		
	15		15
Total Credit Hours: 126			

Total Credit Hours: 126

A technical elective is a 300- or higher-level course in any engineering discipline (other than required MMAE courses or their equivalent) or in mathematics, chemistry, physics, or computer science. However, not all such courses are acceptable as technical electives. Students should consult their faculty adviser for a determination of which courses are acceptable. In addition, ECE 218, ECON 423, INTM 437 and INTM 438 are permitted. Any substitutions require written approval by the department.

An engineering elective is a 300- or higher-level course in any engineering discipline (other than required MMAE courses or their equivalents).

Specialization Requirements

Program Outcomes and Assessment Process

What are the learning goals for this program?

In what semesters will the data be collected to assess this learning goal, and by whom?

Provide the name of the rubric that

assess the extent to which students are achieving this

will be used to

learning goal.

How often and by whom will the data be analyzed? What benchmarks or targets will be used to interpret your results?

Briefly describe the process that will be used to share the results with faculty and use these to motivate program

Attach Additional Assessment

improvement.

Undergraduate Program Requirements

Undergraduate Degree Requirements

Minimum credit

126

hours

Specialization

No

required?

Minor required? No

Proposed General Curriculum

List Major Course

Requirements

List Mathematics

Requirements

List Science

Requirements

List Computer

Science

Requirements

List Humanities and

Social Sciences

Requirements

List

Interprofessional

Project (IPRO)

Requirements

List Technical

Elective Course

Options

List Free Elective

6

Credit Hours (if

applicable)

Semester-by-

semester plan of

study for the

degree program

Reviewer Louis Cattafesta III (Icattafestaiii) (10/20/23 3:14 pm): Rollback: changes needed Comments

Key: 16