

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

In Workflow

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

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

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

Program Status	Active
Requestor	Name Murat Vural E-mail vural@iit.edu
Origination Date	2023-10-20 2021-12- +
Is this an interdisciplinary program?	No
Academic Unit	Mechl, Materials & Arspc Engrg College Armour College of Engineering
Program Title	Bachelor of Science in Materials Science and Engineering
Effective Academic Year	2024 2022 - <u>2025</u> Effective Term Fall 2024 2023
Academic Level	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.	<p><u>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.</u></p> <p><u>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 attached document entitled "Minor Curriculum Changes in the MMAE Department.pdf".</u></p>

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)

Program Narrative and Justification

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 initiative 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 Program Justification Document(s)	BS-Aerospace Engineering and BS-Materials Science Engineering -UGSC Approval Notes for AY2020-21 Bulletin.pdf Minor Curriculum Changes in the MMAE Department.pdf	

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

MMAE 465	Electrical, Magnetic, and Optical Properties of Materials	3
MMAE 470	Introduction to Polymer Science	3
MMAE 472	Advanced Aerospace Materials	3
MMAE 476	Materials Laboratory II	3
MMAE 485	Manufacturing Processes	3
Materials Science Requirement		(3)
MS 201	Materials Science	3
Mathematics Requirements		(18)
MATH 151	Calculus I	5
MATH 152	Calculus II	5
MATH 251	Multivariate and Vector Calculus	4
MATH 252	Introduction to Differential Equations	4
Physics Requirements		(11)
PHYS 123	General Physics I: Mechanics	4
PHYS 221	General Physics II: Electricity and Magnetism	4
PHYS 224	General Physics III for Engineers	3
Chemistry Requirement		(4)
CHEM 124	Principles of Chemistry I with Laboratory	4
Computer Science Requirement		(2)
CS 104	Introduction to Computer Programming for Engineers	2
Technical Electives		(9)
Select six credit hours¹		6
<u>Select nine credit hours¹</u>		<u>9</u>
Engineering Elective		(3)
Select three credit hours ²		3
Humanities and Social Sciences Requirements		(21)
See Illinois Tech Core Curriculum, sections B and C		21
Interprofessional Projects (IPRO)		(6)
See Illinois Tech Core Curriculum, section E		6
Free Elective		(6)
Select six credit hours		6
Total Credit Hours		126

¹ 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.

² 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

Semester 1	Credit Hours	Semester 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	CS 104	2
		Social Sciences Elective	3
	15		17
			Year 2
Semester 1	Credit Hours	Semester 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 Hours	Semester 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 Hours	Semester 2	Credit Hours
MMAE 470	3	MMAE 472	3
MMAE 476	3	I PRO Elective II	3
MMAE 485	3	Technical Elective ¹	3
I PRO Elective I	3	Engineering Elective ²	3
Technical Elective ¹	3	Social Sciences Elective (300+)	3
Technical Elective¹	3		
	15		15
Total Credit Hours: 126			

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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 will be used to assess the extent to which students are achieving this 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 improvement.

Attach Additional Assessment

Undergraduate Program Requirements

Undergraduate Degree Requirements

Minimum credit hours 126

Specialization required? No

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 Credit Hours (if applicable) 6

Semester-by-semester plan of study for the degree program

Reviewer
Comments

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