

Coursework

Coursework for the Thrust areas is divided into six categories with courses from each category taken in succession. All courses **MUST** be taken for a letter grade with the exception of MSE courses, which should be taken for credit/no-credit. The Thrust area categories are:

1. Deficiency requirements (if needed)
2. MSE Seminar
3. Core Materials Science courses
4. Required Thrust Area courses
5. Advanced level elective courses
6. MSE Courses

Deficiency Requirements:

If it is necessary for you to take deficiency courses, they must be taken in the first semester they are offered after you enter the program. The graduate advisor will determine, after meeting with you, whether these courses are necessary for successful completion of graduate-level course work. These courses are:

- 1) Upper division, undergraduate Solid State Properties/Quantum Mechanics: PH 355, CH 354, or the equivalent
- 2) Upper division, undergraduate Classical Thermodynamics: CH 353, or the equivalent.

Core Materials Science Courses:

For those who have entered the program BEFORE Fall 2021:

1. Phase Transformations: ME 386P1 or equivalent
2. Thermodynamics: ME 386P3, CH 382L, CHE 387, or equivalent
Choose 1 from 3 below
3. Mechanical Behavior of Materials: ME 386P2 or equivalent
4. Structure of Materials: ME 386P5 or equivalent
5. Solid State Properties of Materials: ME 386P4 or equivalent

For those who have entered the program AFTER Fall 2021:

1. Phase Transformations: MSE 386P1 or equivalent
2. Thermodynamics: MSE 386P3, CH 382L, CHE 387, or equivalent
3. Structure of Materials: MSE 386P5 or equivalent
Choose 1 from 2 below
4. Mechanical Behavior of Materials: ME 386P2 or equivalent
5. Solid State Properties of Materials: ME 386P4 or equivalent

Required Thrust Area Courses:

The required Thrust courses depend on the Thrust area you are enrolled in. See below for a list of courses that satisfy each Thrust area. You must take three courses to satisfy this requirement. If you find a course that you think fits into a Thrust area but is not listed, please ask the graduate advisor. New courses are added on a regular basis.

For those who have entered the program BEFORE Fall 2021:

General Materials Science	Clean Energy Materials	Nanomaterials
1. Elective #1	Choose three from list below:	Choose three from list below:

2. Elective #2	1. ME 386Q-14 Electrochemical Materials	1. CHE 384 Nanomaterial Chemistry and Engineering
3. Elective #3	2. CH 390L Electrochemistry I	2. ME 387R-9 Practical Electron Microscopy
	3. CH 390L Electrochemistry II	3. ME 397 Introduction to Micro and Nanomanufacturing
	4. ME 386Q Electrochemical Energy Systems	4. ME 397 Nanotech Sensing/NEMS/Energy
	5. EE 396K-25 Organic/Polymer Semiconductor Devices	5. EE 396V/CHE 384 Inorganic Nanostructures For Device Applications
	6. EE 396K-27 Charge Transport In Organic Semiconductors	6. EE 396V Advanced Solid-State Materials/Nanostructures
	7. EE 396V Semiconductor Nanostructures	7. ME 381R-7 Nanoscale Energy Transport/Conversion
	8. ME 381R Nanoscale Energy Transport/Conversion	
	9. ME 382Q Solar Energy System Design	
	10. ME 397 Nanotechnology for Sustainable Energy	

For those who have entered the program AFTER Fall 2021:

General Materials Science	Clean Energy Materials	Nanomaterials
1. Elective #1	1. Elective #1	1. Elective #1
2. Elective #2	2. Elective #2	2. Elective #2
3. Elective #3	3. Elective #3	3. Elective #3

****Please discuss with your supervising faculty the best three courses for your research interest and dissertation topic.****

Advanced Level Elective Courses:

Advanced level courses are offered in a variety of other subject areas (microscopy, spectroscopy, x-ray diffraction, polymers, etc.) that may be of interest to you, depending on your specific field of study. Please see the current course schedule available on the [TMI website](#) for a list of courses offered for each semester. Electives are selected with the advice and consent of your supervising professor and approval of the graduate advisor.

MSE Courses:

The MS&E program itself offers a limited number of courses under the MSE designation: seminar, core courses, individual research, thesis, report, and dissertation courses. Other academic courses are chosen from courses offered with departmental designations such as Chemical Engineering, Chemistry, Electrical and Computer Engineering, Engineering Mechanics, Mechanical Engineering, and Physics. It is a good idea to plan your program of work early in your academic career with the help of your faculty supervisor and the graduate advisor. Remember that most graduate courses are offered at most once a year, while others are offered less frequently.

MSE 397 Graduate Seminar must be taken at least once before you register for any MSE research courses. This class is offered on a credit/no credit basis. Students who are registered for MSE 397 will be required to attend seminars. Even if you are not registered for the seminar class, MSE seminars are critical for broadening your knowledge base in Materials Science outside of your immediate research area, and for this reason, you are **STRONGLY** encouraged to attend every seminar. Watch for announcements posted on the TMI website, the bulletin boards on the eighth and ninth floors of ETC, as well as via email.

The MS&E research courses are MSE 197R, 297R, and 397R. Be sure to register for MSE research, rather than an equivalent course designation in your faculty supervisor's home department (such as Mechanical Engineering, Electrical & Computer Engineering, etc.). A faculty member must agree to supervise your research before signing up for these courses. Registration for a research (or research problems) course in another department requires permission of the graduate advisor and your research supervisor. Such registration must be on a credit/no credit basis.