

Fall 2022 Registration Notes

Summary of Steps (see below for details):

1. Schedule an advising appointment
2. Review your Academic Requirements Report (ARR) on SPIRE
3. Complete a fillable Course Selection Form (CSF):
https://engineering.umass.edu/sites/default/files/CSF%20fillable%202020-0318_0-2.pdf
4. Send your ARR & CSF to your advisor at least 24 hours before your appointment
5. Meet with your advisor in-person or via Zoom (March 28 – April 22)
6. Enroll in classes once your enrollment appointment opens (beginning April 11 for seniors)
7. Make-up advising (May 5)

Required Registration Process

See SPIRE to determine when your enrollment appointment opens. Students must meet with an advisor *before* they can enroll in fall classes. ME seniors (1 or 2 semesters remaining not including the current semester), IE, and ENGIN-IE students meet with their faculty advisor as shown on SPIRE. All other ME and ENGIN-ME students should meet with Graduate Student Advisors **Grace Kromah-Saydee**, vkromahsayde@umass.edu (non-transfer students with last names starting with A-E), **Camille Coutant**, ccoutant@umass.edu, (non-transfer students with last names starting with F-M), or **Paul Hirsh**, phirsh@umass.edu, (non-transfer students with last names starting with N-Z). Honors students entering their sophomore or later years should meet with their assigned faculty advisors. You should be receiving a Navigate (or e-mail) appointment invitation from your respective faculty or graduate student advisor shortly asking you to sign-up for an appointment; if you do not, please contact them *after* March 23. Post graduate, non senior transfer, double major or dual degree, and study-abroad students should meet with the MIE Chief Undergraduate Advisor (CUA) Dr. Bernd F. Schliemann, bfschlie@umass.edu. For make-up advising, *general advising questions, and ARR or other issues will be addressed by the MIE Academic Advisor*, Kevin Romani, kromani@umass.edu.

Admission to the Major

To be admitted to the ME or IE major, a student must complete, with a grade of C or better, the following courses: Math 131 and Math 132, Engineering 100, or any of the following: Engineering 100, 110-114; ECE 122, CS 121, or M&I-ENG 124; Physics 151; and either Chemistry 111 or Physics 152. A cumulative grade point average of 2.0 and the most recent semester GPA of 2.0 are also required. *NOTE: transfer students from on- or off-campus who have not completed the Introduction to Engineering course (100, 110-114) should contact the CUA to take a substitute course as the Introduction to Engineering courses are not recommended for other than first-year students.*

Curriculum Planning

Advisors offer assistance, but they do not plan the student's course of study. Curriculum worksheets are only guides as not all required courses are offered every semester. *Please inform the MIE Academic Advisor now about any problems that arise from anticipated course offerings. NOTE: please see the included time scheduling grid on the last page of this document if you are planning your schedule before classes are available in SPIRE (usually a week before registration begins).*

Academic Requirements Report

This report is used for graduation clearance. Each student should check their Academic Requirements Report (ARR) on SPIRE and contact the *MIE Academic Advisor* if there are any errors or omissions, particularly regarding transfer credits, AP credits, elective courses, and GenEd courses. *Graduating seniors should check their SPIRE Graduation Date and Academic Requirements Report to verify that all degree requirements will be satisfied.*

Wait Lists

In order to keep the enrollment process fair for all MIE students, we have implemented SPIRE waitlists in lieu of asking students to contact instructors. Please join the waitlist on SPIRE for any MIE classes that are full; waitlists represent only 10% of the class capacity. *NOTE: if the waitlist is also full, please check SPIRE later or find an alternative class – please do not contact the instructor.*

Enrollment Issues

Register as soon as your SPIRE enrollment appointment opens if you need a specific class or section. Many required courses are offered both semesters. Students who cannot enroll in a specific class this semester will be accommodated in the next semester. Students may register for either MIE 302 or MIE 313 and either MIE 402 or MIE 413; students who register for both will be dropped from one of the courses without prior notice. In addition, both MIE 313 and 413 enrollment will be capped in the fall semester so you are encouraged to take these courses in the spring if possible. *If a specific course is essential and you are not able to enroll for any reason, please contact the MIE Academic Advisor immediately.* Note that MIE 201 and 273 are essentially interchangeable and do not need to be completed in the semester indicated on the curriculum worksheet. *Send override requests to the MIE Academic Advisor – not course instructors.*

Undergraduate Teaching Assistant Credit & LRC Tutoring Positions

You are invited to contact faculty anytime about future UTA opportunities; probably the best time is when you are getting ready for your advising appointment. Students can satisfy the MIE or IE Elective requirement by completing the UTA Practicum, MIE 398T. *Interested students should contact the faculty teaching the course for more information; faculty select UTAs for their course(s) and students can only serve as an UTA for one class per semester.* Students serving as UTAs for a second or greater time will not receive academic credit, but will be paid (typically for 5 hours per week). Students should also consider paid tutor positions for the Learning Resource Center. Individual and group tutoring as well as supplemental instructors are sought for sophomore and junior level MIE courses (<https://www.umass.edu/lrc/jobs.html>).

Independent Study

It is often possible to arrange an independent study which can be used as an ME or IE Tech Electives. Students are encouraged to approach faculty to discuss topics of mutual interest or visit: <http://mie.umass.edu/research/independent-study-topics>. Note that **only one** Tech Elective can be satisfied with MIE 396 or 496 *and honors students cannot complete an independent study to meet a technical elective requirement.* See <http://mie.umass.edu/mie/degree-requirements> for the independent study request form.

Study Abroad

Many MIE students have and are studying abroad. The spring semester of your sophomore or fall semester of your senior years are best suited for this opportunity. Please see an International Programs Office advisor if you are interested. Students interested in the 5-year double major in German and engineering iSTEP program which includes a year in Germany (one semester of classes and then an internship with a German manufacturing company) should visit <https://www.umass.edu/german/iSTEP>. *Upon return from abroad, students should meet with the MIE Academic Advisor to ensure all courses transfer correctly.*

Summer Internships

Internships do not replace a class. You can earn pass/fail credit for an internship, but you do not need any additional credits to graduate (since you will exceed the 120 minimum regardless). To earn P/F credit, you will need to pay for a summer course (independent study) – this is particularly relevant for international students and the CUA will sponsor your independent study.

Summer or Winter Classes

If you are interested in UMass Amherst summer or winter classes, request an enrollment appointment through SPIRE. Classes typically offered during summer are CEE 310 (technical elective), CS 121 (in lieu of MIE 124), ENGIN 351, MIE 230, MIE 273, MIE 310, MIE 375, MIE 422 (IE core course or ME technical elective), and MIE 597WT (technical elective). Winter classes are typically limited to geneds. To enroll in a summer or winter class, first logon to SPIRE: *Enrollment > Summer/Wtr/Non-deg Enroll Appt*; then add the appropriate summer or winter session.

Transfer Credit

Before taking classes at another campus, students must complete a prior approval form: <https://www.umass.edu/registrar/sites/default/files/PriorApprovalforTransferWork.pdf>; this is to prevent students from spending time and money on a class that will not transfer in for credit towards your undergraduate degree. Classes completed elsewhere do not impact your UMass cumGPA and will not count for credit unless a grade of “C-” or above is earned. The Registrar’s Office approves all general education requirements, the Office of Student Affairs in 126 Marston Hall approves all science and math courses, and the CUA approves all MIE courses. If you have any problems with transfer credit, email your name, student ID, and course information (both course description and syllabus) to the CUA. *Note: course(s) you completed elsewhere must appear on your UMass transcript before MIE course credit can be awarded. Courses taken elsewhere for the 3rd or greater time need prior approval from the Academic Dean.*

Departmental Honors

The requirements for departmental honors are:

1. MIE H313 & MIE H413 (for ME) and MIE H379, MIE 397DH, & MIE H460 (for IE) each with their parent course (e.g., MIE 313); students must complete these courses or substitute ENGIN 351H for one of them. *ENGIN 351H is specifically designed to initiate your honors thesis or project.*
2. Honors Thesis. MIE 499Y Honors Research with MIE 499T/P Thesis/Portfolio (note that you can find potential advisors and topics here: <http://mie.umass.edu/research/independent-study-topics>).

Students can request departmental honors and exceptions to the offerings in 1 above through the MIE Honors Program Director, Dr. Jae-Hwang Lee, leejh@umass.edu. In addition, MIE 499Y and 499T/P each satisfy a ME Tech Elective or a Level 1 IE Tech Elective. *Note: the Supermileage vehicle course (MIE 497s) does not satisfy a technical elective for departmental honors students.*

iCons Concentration

The requirements for the Integrated Concentration in Science (<https://icons.cns.umass.edu/>) have some overlap with both the industrial and mechanical engineering curriculum: iCons 1 satisfies an interdisciplinary (I) gened, iCons 2 satisfies ENGIN 351, and iCons 3 satisfies the IE or MIE elective.

Full-time Student Status

Undergraduate students must take a minimum of 12 credits per semester to retain full-time student status. If you fall below this minimum, you are not eligible for campus housing, risk any financial aid you have been awarded, and may lose any UMass health coverage; see the appropriate campus office if you have any questions.

Fundamentals of Engineering Exam

Although not required for most ME and IE jobs, students should consider taking the FE exam during their last semester while undergraduate course knowledge is still familiar. The 8-hour exam consists of 180 multiple choice questions. After passing the FE exam, one must obtain at least 4 years of experience (accepted by specific state licensing board) and then take the Principles and Practice (PE) exam. See <http://ncees.org/engineering/> for more information. *Chi Epsilon from CEE typically offers free review sessions taught by CEE faculty every spring semester.*

Certified SolidWorks Associate Exam

SolidWorks CAD software is installed on computers in the Exploratorium (Elab 203). In addition, you can download the student version of SolidWorks at no cost and there tutorials included. Students should also consider taking the no-cost CSWA exam before seeking an internship, co-op, or job. See <https://www.solidworks.com/sw/support/cswa-academic.htm> for more information and a sample exam. For the link to the current version of SolidWorks and/or once you are ready to take the self-administered CSWA exam, request a voucher code from Jennifer Blake, jblake@umass.edu; the exam instructions are available at <https://solidworks.virtualtester.com/#home>. Note that exam vouchers expire after approximately 2 months.

4 + 1 Programs

There are currently three MIE 5-year BS/MS programs (<https://mie.umass.edu/41-bsms>): MS in Mechanical Engineering, MS in Industrial Engineering, and MS in Engineering Management (MSEM). Interested students should plan to take up to two graduate courses in their senior year. Two MIE technical electives (at the 500 level or above) will also satisfy 2 of the 10 graduate courses (30 graduate credits) required to earn your MS in the aforementioned 4+1 programs. For a list of these classes, see the MIE Graduate Handbook (<http://mie.umass.edu/mie-graduate-programs>) and the last page of this document or SPIRE for the upcoming semester.

Industrial Engineering Technical Electives

Students should determine the area of IE that most interests them as early as possible in their undergraduate careers and consider elective courses whenever they qualify. To assist in that endeavor, the following tracks are offered with technical electives to support your interests (including the upcoming semesters they will *tentatively* be offered):

1. Decision Analytics (core classes MIE 397DH & MIE 273):
 - a. MIE 597AS – Introduction to Analytics & Statistical Learning: F22
 - b. MIE 597xx – Programming for Industry 4.0: S23
 - c. MIE 597xx – Analytics of Energy: S24
 - d. CS 590w – Health Informatics & Data Science
 - e. ECE 597DE – Data-Driven Decarbonization of Electricity Networks: S24

2. Energy (core class MIE 230):
 - a. MIE 230 – Thermodynamics
 - b. MIE 597xx – Analytics of Energy: S24
 - c. ECE 597DE – Data-Driven Decarbonization of Electricity Networks: S24
3. Health Applications (core classes MIE 379 & MIE 380):
 - a. MIE 458 – Connections in Medicine, Biology, & Engineering: S22
 - b. MIE 565 – Operations Research in Healthcare: S24
 - c. CS 590w – Health Informatics & Data Science
 - d. SOM 597LG – Humanitarian Logistics and Healthcare
4. Human Factors (core class MIE 460):
 - a. MIE 597AV – Vehicle Automation: F22
 - b. MIE 597VR – Augmented/Visual Reality Design: F22
 - c. PSYCH 315 – Cognitive Psychology (prereq 241 only for psych majors)
5. Intelligent Manufacturing (core class MIE 375):
 - a. MIE 597AU – Industrial Automation: S24
 - b. MIE 597MA – Intelligent Manufacturing: every fall
 - c. MIE 597SL – Supply Chain Logistics; F23
 - d. MIE 597xx – Programming for Industry 4.0; S23
6. Supply Chain Management (core class MIE 477; *should take 6th semester*):
 - a. MIE 532 – Network Optimization:
 - b. MIE 544 – Layout and Design: F23
 - c. MIE 597SL – Supply Chain Logistics; F23
 - d. MIE 597SB – Simulation-based Optimization: S24
7. Transportation Systems (core class MIE 477; *should take 6th semester*):
 - a. MIE 532 – Network Optimization: S24
 - b. MIE 597AV – Vehicle Automation: F22
 - c. MIE 597SL – Supply Chain Logistics: F23
 - d. CEE 310 – Transportation
 - e. OIM 413 – Logistics and Transportation
8. Mechanical Engineering (core class MIE 211)
 - a. MIE 230 – Thermodynamics
 - b. MIE 310 – Dynamics
 - c. MIE 340 – Fluid Mechanics
 - d. MIE 302 – Junior Lab
 - e. MIE 313 – Design of Mechanical Components
9. Minors: IE students can consider technical minors like computer science and math where most courses for the minor satisfy all your electives (technical, IE, and free) or non-technical electives like business (engineering management) where two of the required courses will satisfy the IE and free electives.

As courses are not offered every semester, students should consider taking the IE required courses for which they qualify. Tracks of interest should be identified as early as possible so that students pursuing summer internships or co-ops have some background for the industry positions they are seeking. All IE students should discuss the selection of tracks and electives with their advisors; *e-mail your student number, major, and a course description to the CUA for approval of electives not listed below*. There is no limit to how many electives, including technical electives, you can take outside of the department.

1. A Technical Elective can be any 200 or higher level MIE course except MIE 398T and the MSEM courses (MIE 520, 564, 597EP, 645, 654, 664, 670, 697EP, 697U). One Independent study can be used if neither MIE 499Y or 499T/P are used. Other acceptable courses are: CEE 310, 370, 410, 411, 418, 450, 470; ECE 242, 597C, 597D, 597SE; Computer Science 187, 250, 311; Kinesiology 460; Math 455, 537, 551, 552; Resource Economics 471; Statistics 516; BCT 520, 540, 550; OIM 321, 413; ISOM 597LG. *Note for Classes of 2023 and 2024:* a Level 2 IE Tech Electives include any technical elective course; Math 300, 456; Economics 309, 394IO; Resource Economics 452, 462, 472; Informatics 397F, OIM 451, Psychology 391RJ; EMM courses; and MSEM courses.
2. An IE Elective course includes any technical elective courses; MIE 398T; Chemical Engineering 290A; Chemistry 112; Computer Science 119, 121 (if you completed MIE 124; Resource Economics 202, 312, 313; Psychology 209H, 304, 307, 330, 380; Kinesiology 270, 272; Management 341; Math 412, 425; and both EMM and MSEM courses.
3. The free elective can be any course at the university except one that is a prerequisite for a required course (e.g., Math 104) or which overlaps significantly with a required course (e.g., Math 127).

Mechanical Engineering Technical Electives

Students should determine the area of ME that most interests them as early as possible in their undergraduate careers and consider elective courses whenever they qualify. To assist in that endeavor, the following themes are offered with potential Tech Electives to support your interests (including the upcoming semesters they will *tentatively* be offered):

1. Advanced Fluids:
 - a. MIE 440 – Aerospace Fluid Mechanics: S23
 - b. MIE 441 – Internal Combustion Engines: F22
 - c. MIE 442 – Propulsion Systems Performance, Analysis & Design: F22
 - d. MIE 497NM – Introduction to Numerical Methods: S24
2. Biomedical:
 - a. MIE 458 – Connections in Medicine, Biology, & Engineering: S23
 - b. MIE 497R – Mechatronics: every spring
 - c. MIE 597MB – Molecular, Cellular, & Tissues Biomechanics: S23
 - d. MIE 597MD – Practical Medical Device Design: TBD
3. Design:
 - a. MIE 497M – Industry-Sponsored Mechanical Design (prior to MIE 415): every fall
 - b. MIE 497s – Automotive Engineering (Supermileage Vehicle, limited to 25): all
 - c. MIE 562 – Power Systems Design: S23
 - d. MIE 597AV – Vehicle Automation: F22
4. Dynamic Systems and Control:
 - a. MIE 379 – Deterministic Operations Research: every fall
 - b. MIE 485 – Vibrations: S24
 - c. MIE 444 – Automatic Controls: F22
 - d. MIE 597ME – Introduction to MEMS & Microsciences: TBD
5. Energy Conversion:
 - a. MIE 570 – Solar & Direct Energy Conversion: every spring
 - b. MIE 573 – Engineering Windpower Systems: every fall
 - c. MIE 597CE – Ocean Renewable Energy: S23
 - d. MIE 597DW – Dynamics of Waves: S23

6. Manufacturing:
 - a. MIE 422 – Statistical Quality Control: every fall
 - b. MIE 477 – Production Planning & Control: every spring
 - c. MIE 597_{SL} – Supply Chain Logistics; F23
 - d. MIE 597_{AU} – Industrial Automation: S24
 - e. MIE 597_{MA} – Intelligent Manufacturing: every fall
7. Materials (certificate program):
 - a. MIE 571/572 – Physical & Chemical Processing of Materials with Project
 - b. MIE 579 – Advanced Materials Engineering (or other 500-level advanced materials course)
 - c. ChE 573 – Materials Science & Engineering Project
 - d. ChE 590c – Mechanical Behavior of Materials
8. Materials (non-certificate):
 - a. MIE 597c – S24
 - b. MIE 497_{AM} – Aerospace Materials: S23
 - c. MIE 597_{EM} – Extreme Materials for Life Protection Applications: S23
 - d. MIE 597_{MM} – Metamaterials: TBD
 - e. MIE 597_{MP} – Advanced Manufacturing Polymers: S23
 - f. MIE 597_{NS} – Nanomaterials & Sensor: F22

*Note that these electives will be capped at 40 students and some are only offered every 2 years. Students accepted onto the Supermileage Vehicle team will be registered for MIE 497s in the fall and spring; it is a three credit course that will count as the MIE Elective in the fall (or your first semester) and as a ME Technical Elective in the spring (or your second semester). Other technical courses in Engineering, Math, CS, Kinesiology, OIM, and science departments may be acceptable as Tech Electives; however, only one ME Technical Elective can be satisfied with a non-MIE course; e-mail your student number, major, and a course description to the CUA for approval. Examples of previously approved non-MIE technical electives are: Biomedical Engineering 597A; Building & Construction Technology 540; Chemical Engineering 555, 589, 597M; Civil & Environmental Engineering 310, 331, 462, 597A; Computer Science 187, 335, 403; Electrical & Computer Engineering 241, 331; Environmental Conservation 697_{SB}; Kinesiology 460, 530; and Math 425, 456, 532H, 545, 551, 552. Lastly, students with strong GPAs can request permission to take non-MSEM 600-level courses to satisfy technical electives. **Note that none of the MIE Electives listed below satisfy a ME Technical Elective.***

MIE Elective

ME students can take one of the following courses to satisfy their MIE Elective requirement: Computer Science 119, 121 or ECE 122 (if not used to satisfy MIE 124); Building & Construction Technology 550; Chemistry 112; Environmental Science 397R; Kinesiology 236, 430; Math 235; and MIE 353, 398T (UTA practicum), EMM or MSEM courses (see <https://mie.umass.edu/graduate-students/ms-programs/master-science-engineering-management>). Other technical courses in Engineering, Math, CS, Kinesiology, OIM, and science departments may be acceptable as the MIE Elective; e-mail your student number, major, and a course description to the CUA for approval.

TIME SCHEDULING GRID—Fall 2022

Monday	Tuesday	Wednesday	Thursday	Friday
8:00-8:50 380 (8:40)	8:30-9:45 422 601 664	8:00-8:50 380 (8:40)	8:30-9:45 422 601 664	8:00-8:50
9:05-9:55 201 380	10:00-11:15 210 442	9:05-9:55 201 402 L1 380	10:00-11:15 210 442	9:05-9:55 201 402 L4
10:10-11:00 211 375	302 L1 402 Lec 607 670	10:10-11:00 211 402 L1 375	302 L3 402 Lec 607 670	10:10-11:00 211 375 402 L4
11:15-12:05 ECE 361	11:30-12:45 113 Lec1 230 313 302 L1 573 609	11:15-12:05 ECE 361 402 L1	11:30-12:45 113 Lec1 230 313 302 L3 573 609	11:15-12:05 ECE 361 402 L4
12:20-1:10	597AV	12:20-1:10 302 Lec	597AV	12:20-1:10
	1:00-2:15 113 Lec2 273		1:00-2:15 113 Lec2 273	
1:25-2:15	302 L2 (2:00) 379 603 657 697RS	1:25-2:15 395A 402 L2	302 L4 (2:00) 379 603 657 697RS	1:25-2:15 402 L5
2:30-3:45 344 397DH 415/497M 458/658 597AS	2:30-3:45 302 L2 441 444	2:30-3:45 344 397DH 415/497M 402 L2 458/658 597AS	2:30-3:45 302 L4 402 L3 441 444 686 X	2:30-3:45 402 L5 597VR
4:00-5:15 340 597/697MA 597/697NS	4:00-5:15 302 L2 413 620 897T	4:00-5:15 340 402 L2 492 497S 597/697MA 597/697NS	4:00-5:15 302 L4 398T 402 L3 413	4:00-5:15 402 L5 597VR (5:30)
5:30-6:45		5:30-6:45	620 897T	5:30-6:45