

MECHANICAL ENGINEERING CURRICULUM

4-Year Program (for students starting in Fall 2024 with 2nd Year – FALL in Valencia, Spain)

Student: _____ ID: _____ Advisor: _____

1st Year – FALL (17 cr) Grade

| | | |
|-----------------------|----------------------------------|--|
| ENG 101 ^C | College Composition (3 cr) | |
| MAT 126 ^C | Calculus I (4 cr) | |
| MEE 101 | Intro to Mech. Eng. (1 cr) | |
| MEE 120 | Eng. Graphics & CAD (2 cr) | |
| PHY 121 ^{C-} | Physics for Eng. & Sci. I (4 cr) | |
| | HVSC Elective (3 cr) | |

1st Year – SPRING (17 cr) Grade

| | | |
|----------------------|---|--|
| MAT 127 ^C | Calculus II (4 cr) | |
| MEE 125 | Computational Tools for MEs (3 cr) or ECE 177 (4 cr) | |
| MEE 150 ^C | Statics (3 cr) | |
| PHY 122 | Physics for Eng. & Sci. II (4 cr) | |
| | HVSC Elective (3 cr) | |

2nd Year – FALL (17 cr)

| | | |
|----------------------|------------------------------------|-------|
| CHY 121/3 | General Chemistry I/Lab (4 cr) | _ / _ |
| or CHY 131/3 | Chemistry for Engineers/Lab (4 cr) | / |
| MAT 228 | Calculus III (4 cr) | |
| MEE 230 ^C | Thermodynamics I (3 cr) | |
| MEE 270 ^C | Dynamics (3 cr) | |
| | HVSC Elective (3 cr) | |

2nd Year – SPRING (16 cr)

| | | |
|----------------------|------------------------------------|--|
| ECE 209 | Fund of Electric Circuits (3 cr) | |
| ENG 320 | Tech. Comm. for Engineering (3 cr) | |
| MAT 258 | Diff. Eq. & Lin. Algebra (4 cr) | |
| MEE 231 | Thermodynamics II (3 cr) | |
| MEE 251 ^C | Strength of Materials (3 cr) | |

3rd Year – FALL (15 cr)

| | | |
|------------|----------------------------------|-------|
| MEE 320 | Materials (3 cr) | _____ |
| or MEE 370 | System Dynamics & Control (3 cr) | |
| MEE 330 | Manufacturing Engineering (3 cr) | |
| or MEE 360 | Fluid Mechanics (3 cr) | |
| MEE 341 | Mechanical Lab I (3 cr) | |
| or MEE 380 | Design I (3 cr) | |
| MEE 381 | Design II (3 cr) | |
| or MEE 456 | Finite Element Method (3 cr) | |
| STS 332 | Statistics for Engineers (3 cr) | |
| or | Engineering Elective (3 cr) | |

3rd Year – SPRING (15 cr)

| | | |
|------------|----------------------------------|-------|
| MEE 320 | Materials (3 cr) | _____ |
| or MEE 370 | System Dynamics & Control (3 cr) | |
| MEE 330 | Manufacturing Engineering (3 cr) | |
| or MEE 360 | Fluid Mechanics (3 cr) | |
| MEE 341 | Mechanical Lab I (3 cr) | |
| or MEE 380 | Design I (3 cr) | |
| MEE 381 | Design II (3 cr) | |
| or MEE 456 | Finite Element Method (3 cr) | |
| STS 332 | Statistics for Engineers (3 cr) | |
| or | Engineering Elective (3 cr) | |

4th Year – FALL (15 cr)

| | | |
|------------|-------------------------------|-------|
| MEE 432 | Heat Transfer (3 cr) | _____ |
| or MEE 471 | Mechanical Vibrations (3 cr) | |
| MEE 442 | Mechanical Lab II (2 cr) | |
| MEE 487 | Capstone Design I (4 cr) | |
| | MEE Technical Elective (3 cr) | |
| | MEE Technical Elective (3 cr) | |

4th Year – SPRING (17 cr)

| | | |
|------------|-------------------------------|-------|
| MEE 432 | Heat Transfer (3 cr) | _____ |
| or MEE 471 | Mechanical Vibrations (3 cr) | |
| MEE 443 | Mechanical Lab III (2 cr) | |
| MEE 488 | Capstone Design II (3 cr) | |
| | MEE Technical Elective (3 cr) | |
| | HVSC Elective (3 cr) | |
| | HVSC Elective (3 cr) | |

^C and ^{C-} indicate the minimum grade required in that course.

| Engineering Elective (3 cr) | |
|------------------------------------|-------|
| Course | Grade |
| | |

| MEE Technical Electives (9 cr) | |
|---------------------------------------|-------|
| Course | Grade |
| | |
| | |

| Human Values and Social Context (HVSC) areas (18 cr) | | | | | Ethics (not part of HVSC) | | | |
|---|--------------|-------|----------------------------|--------------------------------|-------------------------------------|---|--------------------------|--------------------------------|
| Course | HVSC credits | Grade | Western Cultural Tradition | Social Contexts & Institutions | | Cultural Diversity & International Perspectives | Population & Environment | Artistic & Creative Expression |
| 1. | ENG 320 | 3 | | X | | | | |
| 2. | | | | | | | | |
| 3. | | | | | | | | |
| 4. | | | | | | | | |
| 5. | | | | | | | | |
| 6. | | | | | | | | |
| (if needed) 7. | | | | | | | | |
| (if needed) 8. | | | | | | | | |

Students must complete 18 credits in the HVSC areas, and each of the 5 HVSC areas must be satisfied at least once. Students must also take a course that satisfies the Ethics requirement. Note that some courses satisfy more than one category (e.g. Ethics and an HVSC area).

| MEE Technical Electives | | Prerequisites |
|-------------------------|---|--|
| MEE 430 | Digital Manufacturing | MEE 120, MEE 330 |
| MEE 433 | Solar-Thermal Engineering | MEE 230 ^C |
| MEE 434 | Thermodynamic Design of Engines | MEE 231 |
| MEE 441 | Manufacturing and Testing of Composites | MEE 251 |
| MEE 444 | Robot Dynamics and Control | MEE 270 ^C , MEE 380 |
| MEE 448 | Aircraft Design | MEE 251 ^C , MEE 348, or instructor permission |
| MEE 449 | Aircraft Performance | MEE 348 or instructor permission |
| MEE 450 | Mechanics of Composite Materials | MEE 251 ^C |
| MEE 452 | Aircraft and Automobile Structures | MEE 251 ^C |
| MEE 453 | Experimental Mechanics | MEE 251 ^C |
| MEE 455 | Advanced Strength of Materials | MEE 251 ^C |
| MEE 459 | Engineering Optimization | MAT 228, MAT 258 |
| MEE 462 | Dynamics of Fluid Flows | MEE 360 |
| MEE 463 | Applied Computational Fluid Dynamics | MEE 360 |
| MEE 475 | Fuel Cell Science and Technology | MEE 230 ^C , CHY 121 |
| MEE 477 | Introduction to Structural Dynamics | MEE 251, MEE 270, MAT 258 and MEE 370, or permission |
| MEE 480 | Wind Energy Engineering | MAT 258, MEE 251 ^C , Corequisite MEE 360 |
| MEE 484 | Power Plant Design and Engineering | MEE 230 ^C , MEE 231 |
| MEE 486 | Refrig. and Air Cond. System Design | MEE 231 |
| MEE 489 | Offshore Floating System Design | MEE 360, MEE 380 |
| MEE 490 | Modern Control Theory and Applications | MEE 370 |
| MEE 491 | Offshore Wind Farm Engineering | MEE 251 ^C , MEE 360, or instructor permission |

- 400 level courses offered by other engineering programs may, with MEE Department approval, be counted as a MEE Technical Elective.
- 500 level courses in MEE or other engineering programs may, with instructor and MEE Department approval, be counted as a MEE Technical Elective.

Engineering Elective

The “Engineering Elective” (3 credits) may consist of:

- Any 300 or 400 level MEE elective course, or
- Any 300 or 400 level course in engineering (BEN, CHE, CIE, CET, ECE, EET, MET, SVT), or Innovation Engineering (INV), or Pulp and Paper (PPA), except courses that have significant overlap with a required course.

A list of recommended courses, and prohibited courses, is available at: <https://umaine.edu/mecheng/undergraduate-program/>

A single course may not be counted as both the Engineering Elective and a MEE Technical Elective.

Prerequisites for Required Courses

(A prerequisite course must be taken before. A corequisite course must be taken either before or concurrently.)

| Course | Prerequisites | Course | Prerequisites | Course | Prerequisites |
|------------------------|--|--------------------|---|---------|---|
| MAT 127 | MAT 126 ^C | MEE 125 ECE 177 | Corequisite MAT 126 MAT 126 | MEE 370 | MEE 270 ^C , MAT 258, ECE 209 |
| MAT 228 | MAT 127 ^C | MEE 150 | MAT 126 | MEE 380 | MEE 270 ^C |
| MAT 258 | MAT 127 ^C | MEE 230 | MAT 127 | MEE 381 | MEE 120, MEE 251 ^C |
| STS 332 | MAT 127 ^C | MEE 231 | MEE 230 ^C , MEE 125 / COS 220 / ECE 177 | MEE 432 | MEE 360, MAT 258 |
| PHY 121 | Corequisite MAT 126 | MEE 251 | MAT 127, MEE 150 ^C | MEE 442 | MEE 341 |
| PHY 122 | MAT 126 ^C , PHY 121 ^C | MEE 270 | MEE 150 ^C , corequisite MAT 228 | MEE 443 | MEE 442 |
| CHY 121/3 CHY 131/3 | MAT 126 ^C (* see below) MAT 126 or MAT 122 | MEE 320 | MEE 230 ^C , MEE 251 ^C | MEE 456 | MEE 251 ^C , MAT 258 |
| ECE 209 | MAT 127, coreq PHY 122 | MEE 330 | MEE 120 | MEE 471 | MEE 270 ^C , MAT 258 |
| ENG 320 | ENG 101, soph./jun./sen. | MEE 341 | MEE 251 ^C , MAT 258, coreq MEE 360 | MEE 487 | MEE 360, MEE 381, coreq MEE 370 |
| | | MEE 360 | MEE 230 ^C , MEE 270 ^C , MAT 258 | MEE 488 | MEE 487 |

^C and ^{C-} indicate the minimum grade required in that course.

* CHY 121/123 prerequisite: A grade of C or better in MAT 111, 116, 122 or 126, or no grade in any of these and a passing score on part 2 or 3 of the Math Placement Exam.