

Degree Plan in Materials Science and Engineering

FRESHMAN YEAR (Common Engineering First Year)

| <i>Fall</i> | <i>sch</i> | <i>Pre/Co-reqs</i> | <i>Spring</i> | <i>sch</i> | <i>Pre/Co-reqs</i> |
|--|------------|------------------------|---|------------|---|
| MATH 151 - Eng. Math I | 4 | MATH 150 ¹ | MATH 152 - Eng. Math II | 4 | MATH 151 |
| CHEM 119 - Fund. Chem I * | 4 | | CHEM 120 - Fund. Chem II | 4 | CHEM 119, or CHEM 107/117 |
| ENGL 104 - Comp & Rhetoric | 3 | | PHYS 206 - Newtonian Mechanics for Students in Engineering and Science | 3 | MATH 151 or 171, PHYS 216 ^{cr} |
| ENGR 102 - Engineering Lab I - Computation | 2 | MATH 151 ^{cr} | ENGR 216 (or PHYS 216) - Experimental Physics and Engineering Lab II: Mechanics | 2 | MATH 151 or 171, ENGR 102, PHYS 206 ^{cr} |
| UCC Elective | 3 | | UCC Elective | 3 | |
| | 16 | | | 16 | |

SOPHOMORE YEAR

| <i>Fall</i> | <i>sch</i> | <i>Pre/Co-reqs</i> | <i>Spring</i> | <i>sch</i> | <i>Pre/Co-reqs</i> |
|---|------------|---|--|------------|---|
| PHYS 207 - Electricity and Magnetism for Students in Engineering and Science | 3 | PHYS 206, ENGR/PHYS 216, MATH 152 or 172, ENGR/PHYS 217 ^{cr} | ↔MSEN 380 - Communicating Mat Sci Eng ^w | 1 | COMM 205, or ENGL 210 |
| ENGR 217 (or PHYS 217) - Experimental Physics and Engineering Lab III - Electricity and Magnetism | 2 | PHYS 206, ENGR/PHYS 216, MATH 152 or 172, PHYS 207 ^{cr} | MSEN 210 [H] - Thermodynamics of Materials | 3 | MSEN 201 ^{cr} , MATH 152 ^{cr} |
| MATH 251 - Eng Math III | 3 | MATH 152 | MSEN 250 [H] - Soft Matter | 3 | MSEN 201 ^{cr} , CHEM 102 |
| MSEN 201 - Fundamentals of Materials | 3 | PHYS 206, CHEM 119 or CHEM 107 | MSEN 301 - Unified Mat. Lab 1 | 3 | MSEN 210 ^{cr} , MSEN 260 ^{cr} |
| MSEN 205 [H] - Materials in Society | 2 | MSEN 201 ^{cr} | MSEN 260 - Structure of Materials | 3 | MSEN 201 ^{cr} |
| UCC Elective | 3 | | MSEN 281 - Materials Seminar | 1 | MSEN 201 ^{cr} |
| | 16 | | | 14 | |

JUNIOR YEAR

| <i>Fall</i> | <i>sch</i> | <i>Pre/Co-reqs</i> | <i>Spring</i> | <i>sch</i> | <i>Pre/Co-reqs</i> |
|--|------------|-----------------------------------|--|------------|------------------------------|
| ↔MATH 308 - Differential Equations | 3 | MATH 251 | MSEN 330 [H] - Numerical Methods for Mater Sci Eng | 3 | MSEN 305, MSEN 320, MATH 307 |
| MSEN 305 - Kinetics of Materials | 3 | MSEN 210 | MSEN 400 - Design Analys. Mater Exp | 3 | MSEN 302 |
| MSEN 302 - Unified Mat. Lab 2 ^w | 3 | MSEN 320 ^{cr} , MSEN 301 | MSEN Tech Elective 1 | 3 | |
| MSEN 320 [H] - Deform. and Failure Mech. in Eng. Materials | 3 | MSEN 260 | MSEN 360 - Materials Characterization | 3 | MSEN 250, MSEN 260 |
| UCC Comm. Elective (COMM 205 or ENGL 210) | 3 | | MSEN 325 [H] - Functional Materials Properties | 3 | MSEN 260 |
| MSEN 399 - High Impact Experience for Materials Engineers | 0 | MSEN 205, MSEN 281 | UCC Elective | 3 | |
| UCC Elective | 3 | | | | |
| | 18 | | | 18 | |

SENIOR YEAR

| <i>Fall</i> | <i>sch</i> | <i>Pre/Co-reqs</i> | <i>Spring</i> | <i>sch</i> | <i>Pre/Co-reqs</i> |
|--|------------|------------------------------|---|------------|--------------------|
| UCC Elective | 3 | | MSEN 402 - Materials Research Design II | 3 | MSEN 401 |
| MSEN 401 - Materials Research Design I | 3 | MSEN 205, MSEN 281, MSEN 400 | MSEN Tech Elective 3 | 3 | |
| MSEN 410 [H] - Materials Processing | 3 | MSEN 250, MSEN 305, MSEN 320 | Specialty Elective 2 | 3 | |
| MSEN Tech Elective 2 | 3 | | Specialty Elective 3 | 3 | |
| Specialty Elective 1 | 3 | | UCC Elective | 3 | |
| | 15 | | | 15 | |

* CHEM 107/CHEM 117 is accepted in place of CHEM 119.

^{cr} co-rec¹ or placement exam^w writing intensive class

[H] Honors Designation

↔ pre-reqs waived for MSEN 380

↔ MATH 489 (MATH 307) includes linear algebra & differential equations.
We strongly encourage completion.

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|------------------------|------------|------------|
| Engineering First Year | 31 | sch |
| UCC Electives MSEN | 21 | sch |
| Core | 58 | sch |
| MSEN Tech Electives | 9 | sch |
| Specialty Electives | 9 | sch |
| TOTAL | 128 | sch |