NAME: _____

# MATERIALS SCIENCE AND ENGINEERING

UID: _____ **__ A.A. __ A.S. __ Post-Bac**

| GENERAL EDUCATION REQUIREMENTS | | | |
|---|---|---|---|
| **Fundamental Studies** | | | |
| Academic Writing (AW) | ENGL 101 | | 3 |
| Professional Writing (PW) | ENGL 39X | | 3 |
| Oral Communication (OC) | | | 3 |
| **Distributive Studies** | | | |
| History/Social Sciences (HS*) | | | 3 |
| History/Social Sciences (HS*) | | | 3 |
| Humanities (HU*) | | | 3 |
| Humanities (HU*) | | | 3 |
| Scholarship in Practice (SP*) out of major | | | 3 |
| **I-Series Courses** | | | |
| I-Series (IS*) | | | 0/3 |
| I-Series (IS*) | | | 0/3 |
| **Diversity** | | | |
| Understanding Plural Societies (UP*) | | | 0/3 |
| Understanding Plural Societies (UP*) OR Cultural Competency (CC*) | | | 0/3 |
| **MAJOR REQUIREMENTS** | | | |
| **Basic Sciences** | | | |
| CHEM 135-Chem Engr **or** 131 & 134 -Fund & Prin | | | 3/3&1 |
| CHEM 136 - Chemistry Lab for Eng | | | 1 |
| PHYS 161 - General Physics I (NS) | | | 3 |
| PHYS 260 and 261 - Gen Physics II & Lab (NL) | | | 3 & 1 |
| PHYS 270 and 271 - Gen Physics III & Lab | | | 3 & 1 |
| MATH 140 - Calculus I (MA/AR) | | | 4 |
| MATH 141 - Calculus II | | | 4 |
| MATH 241 - Calculus III | | | 4 |
| MATH 246 - Differential Equations | | | 3 |
| **Engineering Sciences** | | | |
| ENES 100 - Intro to Eng Design (SP) | | | 3 |

| MAJOR REQUIREMENTS | | |
|---|---|---|
| ENES200 or ENEE200 - Tech & Consequences (HU/I-Series) | | 3 |
| ENMA 165 - Intro Programming - Python | | 3 |
| ENMA 180 - MSE: The Field and the Future | | 1 |
| ENMA 300 - Intro to Materials Engineering | | 3 |
| ENMA 301 - Materials Emerging Tech | | 3 |
| ENMA 312 - Experimental Methods in MSE | | 3 |
| ENMA 362 - Mechanical Properties | | 3 |
| ENMA 441 - Characterization of Materials | | 3 |
| ENMA 460 - Physics of Materials | | 3 |
| ENMA 461 - Thermodynamics of Materials | | 3 |
| ENMA 465 - Microprocessing Materials | | 3 |
| ENMA 470 - Materials Selection for Engr Design | | 3 |
| ENMA 471 - Kinetics | | 3 |
| ENMA 487- Capstone Preparation | | 1 |
| ENMA 490 - Materials Design | | 3 |
| **Technical Requirements** | | |
| CHEM 231 & 232-Org Chem I **or** CHEM 481 | | 3&1OR3 |
| TECH 4XX - Tech. Elective** | | 3 |
| TECH 4XX - Tech. Elective** | | 3 |
| ENMA 4XX - Spec. Elective** | | 3 |
| ENMA 4XX - Spec. Elective** | | 3 |
| ENMA 4XX - Spec. Elective** | | 3 |
| ENMA 4XX - Spec. Elective** | | 3 |
| ENMA 4XX - Spec. Elective** | | 3 |
| SCI ELEC - Upper level Science Elective | | 3 |

* May satisfy more than one requirement. See www.gened.umd.edu

**Students should design a course program under the guidance of their advisor. Check the website to see examples of potential specialization electives for each option.

***For Degree Clearance Only***

Degree: B.S. ENMA Advisor: _____

Date:_____ Credits/GPA: _____

***Requirements for Graduation:***

- ☐ Final 30 credits must be earned at UMD
- ☐ 15 of the final 30 credits must be earned at the 300-400 level
- ☐ 12 of the final 30 credits must be upper level major coursework
- ☐ A minimum 2.00 cumulative UM GPA and satisfactory completion of all degree requirements are required for graduation
- ☐ Students matriculating after Fall 2012 must have a 2.0 minimum GPA for all degree requirements, minor requirements, and undergraduate certificate requirements *(Major courses are defined as: departmental courses basic sciences, engineering sciences, specified degree tracks, technical requirements/ technical electives and Professional Writing (PW)*
- ☐ A minimum of 120 credits is required to earn the degree

# Materials Science and Engineering Four Year Academic Plan

**Name:**_____ **UID:**_____

| Year 1 | Fall | | |
|---|---|---|---|
| Gateway requirements include: ENGL 101, CHEM 135, MATH 141, PHYS 161 and an approved Distributive Studies course. (Directly admitted freshman must successfully complete these courses and ENES 100 by 45 UM credits.) | ***Course*** | ***Credit*** | ***Grade*** |
| | ENES 100 (SP) | 3 | |
| | MATH 140 (AR) | 4 | |
| | CHEM 135 | 3 | |
| | CHEM 136 | 1 | |
| | ENGL 101 (AW) | 3 | |
| | ENMA 180 | 1 | |
| | **Total** | **15** | |

| Spring | | |
|---|---|---|
| ***Course*** | ***Credit*** | ***Grade*** |
| ENMA 165 | 3 | |
| MATH 141 | 4 | |
| PHYS 161 | 3 | |
| Hist & Social Sciences (HS)* | 3 | |
| ORAL COMM (OC) | 3 | |
| | | |
| **Total** | **16** | |

| Year 2 | Fall | | |
|---|---|---|---|
| | ***Course*** | ***Credit*** | ***Grade*** |
| | MATH 241 | 4 | |
| | PHYS 260 and PHYS 261 (NL) | 3 & 1 | |
| | ENMA 300 | 3 | |
| | ENES/ENEE 200 (HU/I-Series) | 3 | |
| | | | |
| | | | |
| | **Total** | **14** | |

| Spring | | |
|---|---|---|
| ***Course*** | ***Credit*** | ***Grade*** |
| MATH 246 | 3 | |
| PHYS 270 and PHYS 271 (NL) | 3 & 1 | |
| ENMA 301 | 3 | |
| CHEM 231 & 232 OR 481 | 3 & 1 OR 3 | |
| Hist & Social Sciences (HS)* | 3 | |
| | | |
| **Total** | **16 or 17** | |

| Year 3 | Fall | | |
|---|---|---|---|
| | ***Course*** | ***Credit*** | ***Grade*** |
| | ENMA 312 OR Upper Level Science Elective | 3 | |
| | ENMA 362 | 3 | |
| | ENMA 460 | 3 | |
| | Specialization Elective | 3 | |
| | Scholarship in Practice (SP)* | 3 | |
| | | | |
| | **Total** | **15** | |

| Spring | | |
|---|---|---|
| ***Course*** | ***Credit*** | ***Grade*** |
| ENMA 312 OR Upper Level Science Elective | 3 | |
| ENMA 461 | 3 | |
| ENMA 465 | 3 | |
| ENMA 470 | 3 | |
| Specialization Elective | 3 | |
| | | |
| **Total** | **15** | |

| Year 4 | Fall | | |
|---|---|---|---|
| | ***Course*** | ***Credit*** | ***Grade*** |
| | ENMA 441 | 3 | |
| | ENMA 471 | 3 | |
| | ENMA487 | 1 | |
| | Specialization Elective | 3 | |
| | Technical Elective | 3 | |
| | Professional Writing (PW) | 3 | |
| | **Total** | **16** | |

| Spring | | |
|---|---|---|
| ***Course*** | ***Credit*** | ***Grade*** |
| ENMA 490 | 3 | |
| Specialization Elective | 3 | |
| Specialization Elective | 3 | |
| Technical Elective | 3 | |
| Humanities (HU)* | 3 | |
| | | |
| **Total** | **15** | |

*All students must complete two Distributive Studies courses that are approved for I-series courses. The Understanding Plural Societies (UP) and Cultural Competence (CC) courses may also fulfill Distributive Studies categories.

# Materials Science and Engineering Four Year Academic Plan