**MATERIALS SCIENCE AND ENGINEERING SAMPLE CURRICULUM**

*University of Washington*

*September 2009*

<table>
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<tr>
<th>FRESHMAN – AUTUMN QUARTER</th>
<th>FRESHMAN – WINTER QUARTER</th>
<th>FRESHMAN – SPRING QUARTER</th>
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<tbody>
<tr>
<td>♦ MATH 124 – Calculus I</td>
<td>♦ MATH 125 – Calculus II</td>
<td>♦ MATH 126 – Calculus III</td>
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<td>♦ CHEM 142 – Chem &amp; Lab I</td>
<td>♦ CHEM 152 – Chem &amp; Lab II</td>
<td>♦ PHYS 121 – Mech &amp; Lab</td>
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<td>♦ ENGL COMP</td>
<td>VLP/A/I&amp;S</td>
<td>♦ CSE 142 – Comp Progr I</td>
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<td>QUARTER TOTAL</td>
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**SOPHOMORE – AUTUMN QUARTER**

| ♦ MATH 307 – Diff. Equations | ♦ PHYS 122 – Electro & Lab | AA 210 – Statics | HCDE 231 | VLP/A/I&S |
| 3                           | 5                         | 4              | 3        | 2         |
| MATH 308 – Matrix Algebra   | ♦ PHYS 123 – Waves & Lab  | CEE 220 – Intro to Mech of Mats | ♦ MSE 170 – Fund of Mat Science |
| 3                           | 5                         | 4              | 4        |
| QUARTER TOTAL               |                           |                |          |
| 17                        |                           |                |          |

**JUNIOR – AUTUMN QUARTER**

| MSE 310 – Intro to MS&E   | MSE 322 – Kinetics & Microstruct. | MSE 312 – Integrated Junior Lab II |
| 3                         | 4                           | 2              |
| MSE 321 – Thermo & Phase Eq. | MSE 351 – Electron Theory   | SCIENCE Elective or HCDE 333 |
| 4                         | 3                           | 3-4            |
| MSE 331 – Crystall. & Structure | MSE 342 – Materials Processing I | MSE 499 – Senior Project |
| 3                         | 3                           | 3              |
| MSE 311 – Integrated Junior Lab I | MSE 312 – Integrated Junior Lab II |                |
| 2                         | 2                           |                |
| QUARTER TOTAL             | QUARTER TOTAL               | QUARTER TOTAL  |
| 12                        | 16-17                       | 15            |

**SENIOR – AUTUMN QUARTER**

| MSE 499 (x)** | MSE 499 (x)** | MSE 499 (x)** |
| Var.          | Var.          | Var.          |
| MSE 442—Materials Processing II | MSE 491 – Materials Design and Failure | Technical Elective *** |
| 3             | 2             | Var.          |
| MSE 431 – Principles of Phys Mat. | Technical Elective *** | VLP/A/I&S |
| 3             | Var.          | 5             |
| Technical Elective*** | Var.          |                |
| Var.          |                |                |
| QUARTER TOTAL | QUARTER TOTAL | QUARTER TOTAL |
| Var.          | Var.          | Var.          |

**Variable credits (4 required, maximum 5 credits allowed).**

**Variable Credits (16 required).**

†If AMATH 301 is taken in place of CSE 142 take spring quarter sophomore year.

**BOLD face courses are required for Upper-Division Admission**

For more information contact: Engineering Advising, 301 Loew Hall, Box 352180, Seattle, WA 98195-2180

phone (206) 543-1770 – email (engradv@engr.washington.edu)

OR

Kathleen Elkins at Materials Science & Engr Advising, 302 Roberts Hall, Box 352120, Seattle, WA 98195 phone (206) 616-6581 – email (kelkins@u.washington.edu)
Mathematics ................................................................. [24 Credits]

- MATH 124 [5cr] Calculus with Analytic Geometry I
- MATH 125 [5cr] Calculus with Analytic Geometry II
- MATH 126 [5cr] Calculus with Analytic Geometry III
- MATH 307 [3cr] Intro to Differential Equations [pr: MATH 125]
  or AMATH 351
- MATH 308 [3cr] Matrix Algebra w/Applications [pr: MATH 126]

One course from the following list:
MATH 309, AMATH 353, MATH/STAT 390, IND E 315, MATH 324

Sciences ................................................................. [31 Credits]

- CHEM 142 [5cr] General Chemistry with lab
- CHEM 152 [5cr] General Chemistry with lab [pr: CHEM 142]
  (CHEM 145, 155 can substitute for CHEM 142, 152)
- PHYS 121 [5cr] Mechanics with lab [pr: MATH 124]
- PHYS 122 [5cr] Electro/Oscillatory with lab [pr: MATH 125]
- PHYS 123 [5cr] Waves with lab [pr: MATH 126]

Science Elec   [6cr] See adviser for list of science electives.

Written and Oral Communications......................... [12 Credits]

- ENGL COMP [5cr] English Composition
- HCDE 231 [3cr] Intro to Technical Writing [pr: ENGL COMP]

Visual, Literary & Performing Arts

Individuals & Societies [VLPA/I&S]........................... [24 Credits]

Minimum 10 credits in VLPA required.
Minimum 10 credits in I&S required.
Remaining 4 credits can be either VLPA or I&S.

Engineering Fundamentals ........................................... [24 Credits]

- CSE 142 [4cr] Computer Programming  I OR
  AMATH 301 [4cr] Beginning Scientific Computing [pr MATH 126]
- AA 210 [4cr] Engineering Statics [pr: MATH 126 & PHYS 121]
- CEE 220 [4cr] Intro to Mechanics of Material [pr: AA 210]

Two courses from the following list:
- ME 123 [4cr] Visualization and Computer-Aided Design
- ME 230 [4cr] Kinematics and Dynamics [pr: AA 210]
- CHEM E 325 [4cr] Energy and Entropy
  [pr: MATH 126, PHYS 122, CHEM 142]
- EE 215 [4cr] Fund of EE [pr: MATH 126 & PHYS 122]
- IND E 250 [4cr] Fund of Engineering Economy

Materials Science & Engineering
Core Courses.....................................................[49 Credits]

- MSE 310 [3cr] Intro to Material Science & Engr
- MSE 311 [2cr] Integrated Junior Lab I
- MSE 312 [2cr] Integrated Junior Lab II
- MSE 313 [2cr] Integrated Junior Lab III
- MSE 331 [3cr] Crystallography and Structure
- MSE 333 [3cr] Characterization of Materials
- MSE 342 [3cr] Materials Processing I
- MSE 351 [3cr] Electron Theory

Senior Level:
- MSE 431 [3cr] Principles of Physical Materials
- MSE 442 [3cr] Materials Processing II
- MSE 491 [2cr] Materials Design and Failure
- MSE 492 [2cr] Design in Materials Engineering II
- MSE 499 [4–5cr] Senior Project

MSE Tech. Electives................................. [8 Credits]
- 8 credit minimum of MSE courses at the 400 level or higher. Only 1 credit may be MSE 498 or 499. Please see MSE Advisor for list of approved tech. electives. [Cannot take ME 354 or ME 406 for tech. electives.] MSE 421, MSE 443, MSE 452, MSE 462, MSE 463, MSE 471, MSE 473, MSE 475, MSE 477, MSE 485/487, MSE 486/489, MSE 481

MSE (other) Elective Requirement ..... [8 Credits]
All non-MSE engineering courses at the 400-level or higher except HCDE. Please see MSE Adviser for complete list of approved tech. electives.

Total credits required for graduation ........... [180]

Early Admission Requirements
1. Early Admission is an option for AUTUMN QUARTER ONLY.
2. Student MUST be enrolled at UW.
3. Math 124, 125 & 126; or equivalent.
4. 10 credits of physical sciences courses plus the accompanying lab at the level of PHYS 121, 122, 123; CHEM 142, 152.
5. 5 credits of English Composition.
6. 15 of the above 30 credits MUST have been completed at the UW.