1. The purposes of undergraduate curriculum are to:
   a) maintain a rigorous core that covers the breadth and depth of the field and is taken by all students;
   b) allow for maximum flexibility so that individual students, aided by their advisors, may choose and design emphasis areas that suit their interests and needs;
   c) provide opportunity for research and professional experience;
   d) promote creative enterprise and citizenship.

2. The department requires 15 credits of emphasis electives (~5 courses), Junior – Senior years. Generally, two of the emphasis electives come from within the department and 3 from outside the department. The emphasis electives allow students to specialize in emphasis areas (e.g., nanomaterials, structural materials, polymers, electronics materials, biomaterials, ....).

3. In addition to emphasis electives we require an additional 9 credit hours of electives with technical/science flavor. Students may want to use these to bolster their emphasis specialties:
   a) 1 science elective, recommended for the Freshman semester II.
   b) 1 engineering foundations (technical/science) elective recommended Sophomore semester II.
   c) 1 Engineering and Society elective, Senior semester II
Electronic, Optical, & Magnetic Materials

EM principals
- ECE 220 Electrodynamics I (ECE 230) 3
- ECE 235 Intro. Solid State Elect (Phys 202) 3

Quantum
- Phys 205 Modern Physics for Eng. (Phys 202) 3
- Phys 241 Modern Physics (phys 202) 3
- Phys 244 Modern Physics (phys 202) 3

Applied or Theoretical Solid State
- Phys 551 Solid State Physics (quantum) 3
- ECE 335 Microelectronic devices (ECE 220, 230) 3
- MSE 803 Adv. Elect. Mat. (MSE 456) 3

Optics / Photonics
- ECE 434 Photonics I (ECE 320, 335) 3
- Phys 625 Applied Optics (3 semesters grad level phys or consent instr) 3

Processing
- MSE 434 Thin film deposition 3
- CBE 544 Processing of Electronic Mat. (ECE 335) 3
- MSE 401 Nanomaterials 3

Characterization
- MSE 770 Surface and interface char. 3
- MSE 448 x-ray diffraction 3

Suggestions:
1 course from each of these 3 areas:

Any 2 courses, total, chosen from among these 3 areas:
Suggestions:
1. At least two MSE courses.
2. At least one course from each category (box).
Choose from among these electives:

- MSE 433 Corrosion (3 credits)
- MSE 435 Joining (3 credits)
- MSE 462 Welding (3 credits)
- MSE 465 heat treating (3 credits)
- EMA 303 Mechanics Of Solids (3 credits)
- ME 429 Metal cutting (3 credits)
- ME 313 Manufacturing processes (3 credits)
- MSE 463 Materials for High temperature service (3 credits)
- MSE 448 x-ray diffraction (3 credits)
- CS 310 (Math 222) or CBE 401 (chem Proc. Model) (3 credits)
Bio-Materials Option Examples  
(Entries in bold are highly recommended)

- **Science electives**
  - Zoology 151, 152, Introductory Biology

- **Engineering Foundations**
  - EMA 303 Mechanics of Materials

- **Materials Science**
  - MSE 433 Corrosion
  - BME 430 Interactions with Materials
  - MSE 541 Mechanics of Heterogeneous Materials

- **Biomechanics**
  - EMA 630 Viscoelasticity
  - BME 315 Biomechanics
  - BME 511 Tissue Engineering
  - BME 615 Tissue Mechanics

- **BME/MSE Cell Biomechanics (Murrell, beginning Fall 2014)**

- **Advanced Biology**
  - Zoology 570 Cell Biology
  - BME 547 Biomedical Optics