



## **BASIC SCIENCES**

22 credits

Introduction to Materials Chemistry (3)

Computer Programming (3)

Students must complete one of the following courses, or equivalent (with permission):

- 510.408 Mathematical and Computational Methods
- 600.107 Introduction to Programming in Java
- 600.120 Intermediate Programming
- 500.200 Computing for Engineers and Scientists

Changed to

Computer Programming (3)

- 510.202 Computation and Programming for Materials Scientists and Engineers (offered Spring, 2012 and following springs)

## **SCIENCE AND ENGINEERING ELECTIVES (6)**

- One course of upper level engineering, natural sciences or mathematics
- Upper level is 300 or higher

Science Elective I (upper level) (3)

Science Elective II (3)

Changed to

## **SCIENCE AND ENGINEERING ELECTIVES (6)**

- Two courses of 200- level or above in engineering, natural sciences or mathematics

Science Elective #1 (3)

Science Elective #2 (3)

## **UNRESTRICTED ELECTIVES**

- 6 credits of unrestricted electives

Changed to

## **UNRESTRICTED ELECTIVES**

- 9 credits of unrestricted electives

A student who has taken both 030.101 and 030.102 may count one of them toward one unrestricted elective.

## Changes in 2013-2014 Advising Manual

1. Updated the program educational objective based on the relevant section in the self-study report for the Nov. 2011 ABET site visit and the department webpage.
2. New biomaterials/nanomaterials senior design course numbers and descriptions have been added in the course list. Future biomaterials concentrators or nanotechnology concentrators will use these new course numbers in lieu of the standard senior design.
3. Course description has been removed for Biocompatibility, which is not going to be offered as a separate course for the next 4 years.
4. Added 510.109 (Mater. Sci. Eng. for the 21<sup>st</sup> Century) in the list of course description and in the sample program.
5. Added "students can substitute Cell Biology+Biochemistry for Mol & Cells".
6. Added "students can substitute LADE+an upper-level mathematics course for LA+DE".
7. Added an update about the pending change from the current "tracks" to approved "concentrations":

The department has recently submitted proposals to JHU and the State of MD to formally convert the tracks to the Biomaterials Concentration and the Nanotechnology Concentration within the Materials Science and Engineering undergraduate program. Once approved, the tracks will be re-named as concentrations, and successful completion of the Biomaterials Concentration and Nanotechnology Concentration can be formally noted on the student's transcript.

8. This expected formal change (in 2014) has been noted in several places, and the previous "track" requirements have been replaced by new "concentration" requirements: 3 electives for the concentration, a dedicated lab course, and a required year-long (bio or nano) senior design project (see Item 1 above).

The "Sample Curriculum for Biomaterials Track" has been changed accordingly (see 4th year suggestions) to reflect the new concentration requirements.

The short paragraph that implied an easy route to achieve "double tracks" has been removed.

## Changes in 2015-2016 Advising Manual

Removed Mol Cell (4), Circuits (4) and Statics (4) from the “Basic Engineering” category (see Sci. Eng. Electives below). Merged the rest under “Basic Engineering” (computation course and the new "Leadership and Management in MSE") with the “Basic Science” category:

The new category is then

(Required) Basic Science and Engineering  
28 credits

Existing Basic Science courses

+

510.202 Computation and Programming for MSE (3)

660.3## Leadership and Management for MSE (3)  
(e.g., junior fall semester)

Petitions can be made to use equivalent courses to substitute for these two.

All other requirements in the Advising Manual remain the same.

Total credits required for degree is now 126

(Most students would reach 127, because the Mols Cell, or Statics, is 4 credits, see below).

Sci. Eng. Electives:

Now it requires 9 credits (previously 6)

We require that at least one of the 3 courses must be from another department in WSE (to ensure the exposure to another engineering field).

580.221 Molecules and Cells (4) or its equivalent is required for the biomaterials concentration

530.201 Statics and Mechanics of Materials (4) is an option for Nano Concentration and standard track

(This gives some students the *flexibility* to choose a more useful course, under the guidance of his/her faculty advisor)

Introductory language courses, even if not w/ H or S designator, can substitute for H designated courses.

HUMANITIES (H OR S)

- Letter grade of C- or higher (or S if the grade system is S/U)

Independent Research and Senior Design can now be carried out in a team setting; more to come in the next revision.

Regarding letter grade versus S/U, the dept. policy is now spelled out:

Students are encouraged to challenge themselves by taking courses that are outside of their core area or at higher level than they might be rigorously prepared for. Such courses may be taken with the S/U option. The JHU policy is that only one course per semester or summer may be taken for S/U credit. However, an eligible student who registers for a course that is only offered for S/U credit may select an additional S/U course in the same semester. For MSE, all the core requirements should be taken for a letter grade. The electives that can be taken S/U are specified in the list above. These include SCIENCE AND ENGINEERING ELECTIVES, HUMANITIES, AND UNRESTRICTED ELECTIVES.