Template for ABET course syllabi (new format)

1. *Course number and name*
   ENGR 203: Materials of Electrical and Electronic Engineering

2. *Credits and contact hours*
   3 Credits.

3. *Instructor's or course coordinator's name*
   Instructor: Nilgun Ozer, MEP Director
   Course coordinator: Nilgun Ozer, MEP Director

4. *Text book, title, author, and year*
   Ian P. Jones. *Materials Science for Electrical and Electronic Engineers.*
   Oxford University Press, 2001.

   a. *other supplemental materials*
      - W. D. Callister. *Materials, Science and Engineering*. Willey, 2000.
      - W.F. Smith and J. Hashemi. *Foundations of Materials Science and Engineering*.3rd ed. McGraw-Hill, 2003.
      - M. Ohring. *Engineering Materials Science.* Academic Press2, 2001.
      - J.L.Shackelford. *Introduction to Materials Science and Engineering*. Prentice Hall, 2003.
      - D.V. Morgan and K. Board. *An Introduction to Semiconductor Micro-technology*. 2002.

      (Optional References)

5. *Specific course information*
   a. *brief description of the content of the course (catalog description)*

      Application of basic principles of physics and chemistry to electrical and electronic (EE) engineering materials. Conductors, insulators and semiconductors; electrical conductors; mechanical properties of conductors, manufacturing conductors; electrochemistry; electrical insulators; plastics; magnetic materials; superconductors and optical fibers.

   b. *prerequisites or co-requisites*
      A grade of C or better in CHEM 115

   c. *indicate whether a required, elective, or selected elective course in the program*
      Elective for Electrical Engineering.

6. *Specific goals for the course*
   a. specific outcomes of instruction, ex. The student will be able to explain the significance of current research about a particular topic.

- The student will demonstrate an ability to describe and solve problems on atomic arrangements, geometry of perfections, and atomic diffusion in electric and electronic materials.
- The student will demonstrate an ability to describe and solve problems on electrical and mechanical behavior of conductors, insulators and semiconductors.
- The student will demonstrate an ability to submit homework solutions in proper engineering format.

- The student will demonstrate an ability to describe and solve problems on the distinguishing properties of conductors, insulators and semiconductors.
- The student will demonstrate a familiarity with the applications of engineering materials in electric and electronic devices.
- The student will demonstrate an understanding of the principles of the operation and fabrication of microelectronic devices from materials viewpoint.
- The student will demonstrate ability to present technical information clearly in both oral and written formats.

explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.

Course addresses ABET Student Outcome(s): a, e, g, h

7. *Brief list of topics to be covered*

- Conductors insulators and semiconductors
- Electrical conductors: metals
- Electrical Insulators: ceramics and plastics
- Semiconductors and other Materials: magnetic materials, superconductors and optical materials
- Electrochemistry: electroplating and corrosion