ABET Course Syllabus for MET 382: Plastics and Composites

1. Course number and name: MET 382: Plastics and Composites

2. Credits and contact hours: 4 credit hours, 4 hours per week

3. Instructor's Name: Dennis Capovilla

4. Textbook, title, author, and year:
   - *Plastics: Materials and Processing,* by A. Brent Strong, Prentice-Hall.

   a. Other supplemental materials:
      - Software for Internet access,
      - Word processing,
      - Spreadsheet,
      - Graphing capability required.

5. Specific course information:
   a. Brief description of the content of the course (catalog description): Composition, characteristics, and classifications of plastics and composite materials incorporating industrial applications, processing, and fabrication. Design, prediction, and testing of plastic and composite structures. Formerly MET 482, students may not receive credit for both. This course consists of four hours of lecture plus an associated lab for 2 hours a week.

   b. Pre-requisites: (CHEM 111 and CHEM 111LAB), or (CHEM 181 and CHEM 181LAB). Co-requisites: MET 382LAB.

   c. Required, elective, or selected elective (as per Table 5-1) course in the program: Required

6. Specific goals for the course:
   The fundamentals of plastics and composites are presented.

   a. Specific outcomes of instruction:
      - Classify and identify polymers and composites in engineering context.
      - Characterize polymer constituents and describe their life cycle.
      - Design and process polymers and composites to obtain predicted properties.
      - Fabricate basic polymer/composite parts.
      - Select and improve polymer/composite processes for increased manufacturing efficiency.

   b. Criterion 3 student outcomes addressed by course:
      3 (1)

7. Brief list of topics covered:
   - Bonds

- Organic chemistry
- Thermosets
- Micro Properties
- Engineered Materials
- Design of Plastics and Plastic Structures
- Thermoforming
- Composite Introduction & Design
- Radiation
- Finish & Assembly
- Environmental & Operational Constraints
- Repair

ABET Course Syllabus for MET 382: Plastics and Composites Laboratory

1. Course number and name: MET 382: Plastics and Composites Laboratory

2. Credits and contact hours: 1 credit hours, 2 hours per week

3. Instructor's Name: Dennis Capovilla

4. Textbook, title, author, and year:
   - *Plastics: Materials and Processing,* by A. Brent Strong, Prentice-Hall.

   a. Other supplemental materials:
      - Software for Internet access,
      - Word processing,
      - Spreadsheet,
      - Graphing capability required.

5. Specific course information:
   a. Brief description of the content of the course (catalog description): Practical application of design analysis, manufacturing, and evaluation of plastics and composites. Lab work includes the design, fabrication, and evaluation of a composite structure. This course consists of two hours of lab each week plus an associated lecture for four hours per week.

   b. Pre-requisites: (CHEM 111 and CHEM 111LAB), or (CHEM 181 and CHEM 181LAB).

   c. Required, elective, or selected elective (as per Table 5-1) course in the program: Required

6. Specific goals for the course:
   Applying the fundamentals of plastics and composites are presented.

   a. Specific outcomes of instruction:
      - Apply subject content to both predict behavior and compare with experimental results.
      - Design test systems to quantitatively demonstrate subject matter concepts.
      - Collect experimental data to quantitatively demonstrate subject matter concepts.

   b. Criterion 3 student outcomes addressed by course:
      3 (1)

7. Brief list of topics covered:
   - Bonds
   - Organic chemistry
   - Thermosets
   - Micro Properties
   - Engineered Materials
   - Design of Plastics and Plastic Structures

- Thermoforming
- Composite Introduction & Design
- Radiation
- Finish & Assembly
- Environmental & Operational Constraints
- Repair