

PTFE 4210 POLYMER AND FIBER ENGINEERING DESIGN II
Credit: 3-0-3

Course Coordinators: Dr. Meisha Shofner

Prerequisites: PTFE 4110

Catalog Description: A team problem-solving approach is used to work on a project developed in cooperation with a polymer/fiber/textile company. Weekly communications, both oral and written, are required.

Course Learning Objectives:

1. Practice engineering on a significant project to develop the ability to work with limited supervision.
2. Gain valuable experience solving real-world problems.
3. Learn to communicate ideas better.
4. Develop oral and written communication of technical information.
5. Experience team-based problem solving.

Textbook: K.T. Ulrich and S.D. Eppinger, Product Design and Development, McGraw-Hill, Third Edition, 2003.

Useful resources:

1. G.E. Dieter, Engineering Design: A Materials and Processing Approach, 3rd Edition, McGraw-Hill Book Company, 1999.
2. D.G. Ullman, The Mechanical Design Process, McGraw-Hill, 1992.
3. M.L. Shillito, Advanced QFD – Linking Technology to Market and Company Needs, John Wiley & Sons, Inc., 1994.
4. G. Voland, Engineering by Design, Addison-Wesley, 1999.

Topical Outline of Lectures:

There will be weekly meetings to review the progress on the project. Regular reports outlining the progress should be presented during these meetings. Team members should take turns writing the report and participate in the discussions.

Course Outcomes: Specifically, at the end of the course the students will be able to:

1. Integrate knowledge of mathematics, science, and engineering to the design of a polymer and fiber engineering system [1]*.
2. Apply and integrate knowledge from the structure, properties, processing, and performance of polymers and fibers to solve materials selection and design problem [4]
3. Design a system, component, or process to specified performance objectives and needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability [5].
4. Appreciate diversity in design projects [6].
5. Identify, formulate, and solve polymer and fiber engineering problems [7].
6. Understand the professional and ethical responsibility as a polymer and fiber engineer [8].
7. Communicate effectively in both written reports and oral presentations [9].
8. Demonstrate a broad understanding of the impact of polymer and fiber engineering solutions in a global, economic, environmental, and societal context [10].
9. Recognize the need for, and the ability to engage in, life-long learning [11].
10. Demonstrate knowledge of contemporary issues [12].

* Numbers in Brackets refer to PFE Program Outcomes to which the Course Outcomes relate.

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