



THE OHIO STATE UNIVERSITY
COLLEGE OF ENGINEERING

Design and Professional Practice I

MATSCEN 4381.01

Credit Hours:

3.00

Course Levels:

Undergraduate (1000-5000 level)

Course Components:

Lecture

Course Description:

An in-depth design project to foster independent thinking and to develop problem-solving skills. Design of experiments, applied statistics, presentation and communication skills will be discussed.

Prerequisites and Co-requisites:

Prereq: 3141, 3151, and 3331. Prereq or concur: 3261, 3271, or 3332, and enrollment as MatScEn-BS major; or permission of instructor.

Course Goals / Objectives:

- Learn concepts related to materials design including design of experiments, statistical analysis and data mining
 - Learn how to execute design projects, work in teams and effectively disseminate their findings
 - Learn methods for material inspection, how to identify modes of failure and to troubleshoot design problems
 - Learn concepts related to industrial standards, intellectual property and patents
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Course Topics:

- Research Databases
 - Statistical Methods in Design (design of experiments, main effects plots, applied statistics, power law, ANOVA, t-tests, statistical significance, data mining)
 - Standards and Specifications (Codes, ASTM guidelines, GLP)
 - Role of fracture mechanics/failure modes in design, Inspection methods
 - Cost and data analyses, Value Engineering
 - Quality Tools: Industrial Application of DoE and statistical analyses
 - Proposal writing and critiquing
 - Presentation/Oral communication skills, interviewing skills
 - Patents and Intellectual Properties
 - Proposal Presentations
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Designation:

Required