

ISE/SYS 5487 ISE 4487: Foundations of Systems Engineering

Instructor: Dr. Vijitashwa Pandey
Email: pandey2@oakland.edu
Phone: (248) 370-4044

Semester: Winter 2018
Class: Tue and Thu, 7:30 – 9:17
Office hours: Tuesdays and Thursdays before class in room 514 EC

Course Description

In this 4-credit hour course we will delve into the theories behind system realization. Particularly, the following topics will be covered:

- Identifying and Addressing Customer Needs for Systems Design
- Demand Modeling
- Functional Diagrams
- Uncertainty Modeling and Propagation
- Reliability Engineering
- Design Optimization
- Identifying Stakeholders and their Preferences using Decision Analysis
- Design Structure Matrix
- Design for X
- Design Flexibility

Students entering this class are assumed to have had undergraduate calculus and probability theory. The course is, however, suitably geared to help them reacquire some math skills to understand the class material better.

Expected Learning Outcomes

Successful completion of this course will help you to:

- Understand a system and its constituents, including decision makers.
- Be able to identify performance metrics and how uncertainty affects them.
- Be able to create or model system constituents and the interactions between them for successful realization.
- Understand the connections between system realization and decision analysis, optimization and uncertainty propagation.

Text(s) and Materials

The assigned textbook is Pandey, V., 2013, *Decision Based Design*, Taylor and Francis Group (CRC Press), Boca Raton FL, 284 pages.

Other books helpful in full understanding of the topics are:

1. Ulrich, K. and Eppinger, S., 1999, *Product Design and Development*, McGraw-Hill/Irwin; 2nd Edition, 384 pages.

- Blanchard, B. and Fabricky, W., 2010 *Systems Engineering and Analysis, 5th Edition* by and published by Prentice Hall International, 800 pages.

Instructor & Contact Information

Office hours and email

All course-related questions should be sent to pandey2@oakland.edu. Please start the email subject with SYS. I will hold regular office hours before class on Tuesdays and Thursdays in room 514 EC.

Class Participation

Participation in class is encouraged. While you are not going to be graded on it, my experience is that students that participate, do well in homework, exams and the overall course.

Attendance

Attendance is optional.

Policy on late/missing assignments

It is important to maintain the proper pace in this course. Homework and other assignments are therefore expected to be submitted on time (only hardcopies accepted). Work submitted late without reason will not be accepted. Exceptions may be made for extraordinary circumstances.

Examination policy

There will be one exam, details will be provided in class. Cheating in exams or in homework will not be tolerated. Appropriate action will be taken if someone is found to have engaged in cheating.

Class Project

Students will work on a group project where they will apply the knowledge learned in the class. Details will be provided in class.

Assessment / Grading

Item	Grade	Extra credit as assigned.
Homework (three will be given)	30%	
Project and presentation	40%	
Exam	30%	

This syllabus may change during the course of the semester at the discretion of the instructor. Students will be informed in advance.