IE 470: Manufacturing Systems Design and Analysis

Instructor:
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Course Objectives:
The objective of this course is to provide students with an understanding of modern manufacturing systems. Students will be exposed to the technology and design and analysis methodologies that are used to organize and plan resources for the purpose of manufacturing per scheduling requirements. In addition to modern manufacturing technology such as CNC, Robots and Automation, students will learn techniques for improving productivity in manufacturing enterprises such as design manufacturing workcells, principles of lean manufacturing, just-in-time manufacturing, Kanban, assembly line balancing and MRP/ERP systems. The general concepts covered in the course are widely applicable to service industries and case studies will be used to illustrate the application of these concepts in service industries.

Laboratory assignments throughout the course will be used to provide the hands-on experience related to topics covered in the course.

ABET Outcomes:
1.4 Program flexible manufacturing equipment and system controllers; design logical manufacturing layouts
3.1 Present engineering study results in technical reports and or orally
3.2 Demonstrate independent learning by synthesizing information from several sources
4.2 Knowledge of contemporary issues (lean manufacturing).

References:
There will be no required text for this class. The following will be used for material covered in class.

Grading:
- 35% - (2) Mid-Term Exams
- 25% - Final Exam (On Campus)
- 15% - Homework
- 25% - Labs

Homework Policy:
1. Homework will be due on the date specified. Late homework will be accepted with a 10% per day penalty provided that the assignment has not been discussed in class and no solutions have been posted.
2. All assignments, unless specified otherwise, should be done individually. You may ask questions of others for clarifications and general understanding and discussion, but the final work presented must be solely your own.

Lab Policy:
1. All the labs in this semester will be uniformly weighted, and the grade of each lab will be based on the lab report.
2. Each lab activity is to be completed by each student individually. Do not consult with anyone.

**Exam Policy:**
There will be a two midterm exams and final exam will be given during the semester.

The student will be responsible for providing the proctor’s contact information for the two midterm exams to the PSU web course administrator at the beginning of the semester. Eligibility requirements for the proctor will be posted on the course website.

All students will be required to take the final examination at University Park. Students will receive a deferred grade until the exam has been completed. If a student fails to complete the exam, they will receive a zero grade.

- The Final Exam will be administered at University Park on Date/Time/Place TBA

**Academic Integrity:**

The University defines academic integrity as the pursuit of scholarly activity in an open, honest and responsible manner.
All students should act with personal integrity, respect other students’ dignity, rights and property, and help create and maintain an environment in which all can succeed through the fruits of their efforts (refer to Senate Policy 49-20).

Dishonesty of any kind will not be tolerated in this course. Dishonesty includes, but is not limited to, cheating, plagiarizing, fabricating information or citations, facilitating acts of academic dishonesty by others, having unauthorized possession of examinations, submitting work of another person or work previously used without informing the instructor, or tampering with the academic work of other students.
Students who are found to be dishonest will receive academic sanctions and will be reported to the University’s Office of Student Conduct for possible further disciplinary sanctions (refer to Senate Policy G-9).

**Students with Disabilities:**

Penn State welcomes students with disabilities into the University’s educational programs. If you have a disability-related need for reasonable academic adjustments in this course, contact the Office for Disability Services (ODS) at 814-863-1807 (V/TTY). For further information regarding ODS, please visit the Office of Disability Services website at [http://equity.psu.edu/ods/](http://equity.psu.edu/ods/).

In order to receive consideration for course accommodations, you must contact ODS and provide documentation. If the documentation supports the need for academic adjustments, ODS will provide a letter identifying appropriate academic accommodations. Please share this letter and discuss the adjustments with your instructor as early in the course as possible. You must contact ODS and request academic adjustment letters at the beginning of each semester.