

ISE 445A: Systems Design I

Winter 2005

Course: ISE 445A – Systems Design I – 3 credit hours

Call number: 03986

Catalog Description: Design methodology and principles. Identification and definition of design project. Prerequisites: 330, 333, 432 and ENG 305J.

Session: T @ 3:10-6:00, 271 Stocker

Instructors: Gary Weckman

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Office hours: MW @ 8:30 pm to 11:30 pm or By Appointment

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Textbooks (Reference):

- Niebel, Benjamin W., "Motion and Time Study - 10th Edition", Irwin, 1999.
- Sullivan, William G., James A. Bontadelli, and Elin M. Wicks. "Engineering Economy – 11th Edition", Prentice Hall, Upper Saddle River, New Jersey, 2000.
- Sipper, Daniel and Robert L. Bulfin, Jr., "Production: Planning, Control and Integration", McGraw-Hill Co., Inc., St. Louis, Missouri, 1997.
- Tompkins, James A., and John A. White., "Facilities Planning – 3rd Edition", John Wiley & Sons, Inc., New York, 2003.
- Hillier, F. S. and G. J. Lieberman, "Introduction to Operations Research - 7th Edition", McGraw-Hill, Inc., 2001
- Kelton, David w., Sadowski, Randall P., and Sadowski, Deborah A., "Simulation with Arena – 2nd Edition, McGraw Hill, New York, 2002.

Course objectives:

Under the co-direction of an industry mentor and a faculty member, be able to work as a member of a team and integrate and synthesize industrial engineering tools and skills to solve a problem.

Course prerequisite skills:

Students entering ISE 445A are expected to be able to:

1. Understand probability and random variables.
2. Understand basic deterministic and stochastic models.
3. Understand statistical hypotheses testing.
4. Understand discrete event simulation and simulation models.
5. Understand and be able to use a Gantt chart.
6. Understand classical optimization of Euclidean space mathematical functions.
7. Understand and be able to formulate a basic mathematical program.
8. Understand and be able to do a time study.
9. Understand basic proper ergonomic workspace design principles.
10. Understand forecasting and inventory management models.

11. Understand the two basic aggregate capacity planning models (zero inventory and constant work force).
12. Understand basic scheduling and sequencing heuristics (e.g., SPT, FCFS, EDD, CR)
13. Understand facility layout methods and techniques.
14. Understand engineering economics and depreciation of capital assets.
15. Understand and be able to use a computer programming language.
16. Write brief, clear progress reports.
17. Write a professional-grade technical report.
18. Professionally present a set of possible alternatives.

Course outcomes:

Upon the completion of ISE 445A, students will be able to:

1. Write a project proposal
2. Make a formal presentation describing the solution to a technical problem
3. Identify and apply appropriate techniques to solve an unbounded problem
4. Use project management software to develop and track a project schedule

Computer usage:

Microsoft Excel, Word, Project and Powerpoint along with Simulation (ARENA) and Autocad as needed to be used for formatting, organizing, analyzing and presenting information.

Grading Policy:

Weekly Status & Client Meeting Minutes	10%
Oral Presentation of Proposal	10%
Written Report of Proposal	20%
Group Contribution	20%
Sponsor Evaluation	20%
Interim Status Report	20%

Handouts are available on the web at <http://imse.ent.ohiou.edu/> to detail the grading criteria for the oral and written proposal, peer and sponsor evaluations.

Peer evaluation: Teamwork is an important engineering skill. Part of each student's teamwork grade will be determined from an assessment of his/her participation on a team, submitted anonymously by other team members.

Sponsor evaluation: Professional feedback from industry is essential. Part of each student's team grade will be determined from an assessment based on professional communication, application of appropriate IE techniques and overall quality of the final project by the project sponsor.

The class will be organized into teams. Each team will be mainly responsible for their specific project. Each student will be primarily responsible for his/her own tasks, there is also a significant degree of shared responsibility (to be rotated), since a large portion of everyone's grade depends on a successful outcome of the overall project.

Outline:

1. Team & Project Assignments
2. Lecture: Guide to Industrial Engineering Senior Design Projects
3. Weekly Status (written memo)
4. Client meeting (written minutes)
5. Presentation of past projects (critique)
6. Project Task List and Tentative Schedule
7. Rough Draft: Project Proposal both written and oral (***due by end of January***)
8. Final Draft: Project Proposal both written and oral (***due by first week of February***)
9. Peer review of projects
10. Interim Status Report

Academic Dishonesty: Students using the work of others without giving credit (plagiarism) will receive a failing grade in the course.

Attendance:

Attendance: Attendance is expected at all class meetings. Excused absences require prior approval of the instructor.