ISyE 2030 – Modeling in Industrial Engineering –
Fall 2005
(updated August 28, 2005)

Instructor: Dave Goldsman; Room 433; e-mail sman@isye.gatech.edu; web site www.isye.gatech.edu/~sman; phone 404-894-2365/2301 (O/F).

Class Times and Place: MW 10:05–10:55am, IC 103. Labs take place MW afternoons and generally run about 90 minutes — check your individual schedules.

Office Hours: MWF 8:00–9:00am. Please honor these office hours and come prepared.

Teaching Assistants: Gizem Keysan, gkeysan@isye.gatech.edu, Office Hours: TTh 3:00-4:00pm, W 2:00-3:00pm, Room Main 308.

Sebastian Urbina, gte765y@mail.gatech.edu, Office Hours: TTh 12:00–1:30pm.

Course Objectives: This course introduces students to the discipline of Industrial Engineering, covering some key fields of application, some key IE processes, and some key IE methodologies. The course may use lectures, videos, case studies, and projects. A major focus of the course is “modeling,” or creating abstract and computational representations of IE problems, and using these representations to aid decision-making. Specific modeling approaches, tools, and methods will be introduced, and students will be required to use basic computational tools. Coverage includes projects involving information collection, data acquisition, analysis, and presentation, as well as the motivation and use of analytical, algorithmic, conceptual, and computational models.

Textbooks:


Modeling in Industrial Engineering, Pearson Custom Publishing (there is an older version of the text, so if you purchase a used book, be sure it has the correct ISBN, which is 0-536-66486-2)

Process: The instructional process for this course involves four components: lecture, recitation (lab), homework, and project. All four components are important, and mutually dependent.
• Lectures will present key concepts, methods, and tools, along with motivating examples. Students are encouraged to ask questions, and participate when invited. Obviously, not every possible use of every concept, method, or tool can be covered in lecture, so it is assumed that students, once introduced, will do the assignments and be able to generalize to other similar settings.

• Recitation periods will allow for small group interactive activities that are not feasible in the lecture setting. The recitation periods are an ideal opportunity for students to learn from each other. For example, a number of recitation periods will be devoted to team presentations of projects; these will be good opportunities to point out opportunities to improve presentation skills, and to explore alternative ways to approach complex problem solving. Also, recitations are an opportunity to clear up questions or misunderstandings from the lectures, to review completed homework and quizzes, and to have tutorials in more depth than is practical in the lecture.

• Homework provides each student with an opportunity to develop personal mastery of the concepts, methods, and tools presented in the course. Students may work together on homework assignments and you will not turn in homework to be graded.

• Team projects are another opportunity to learn how to work effectively as a group, and to learn from each other in the group. In particular, a key success factor in the team projects is learning how to share responsibility, and how to allocate work among team members. The teams may be different for each project.

Ground Rules:

• Thank you for showing courtesy and respect to your fellow students and speaker during lectures. With so many folks sharing the same locus, it is important to be extra careful not to distract during the lecture.

• Students are responsible for all announcements made in class and for all changes in the schedule that are posted on the class website.

• If you have specific questions about what I’ve presented in class, please ask. However, I will not give individual lectures to you if you missed the class, nor will the TA.

• Because this is a large class, your first point of contact with questions or problems should be your TA. If you cannot meet your TA during his/her office hours, you should make an appointment. Whenever there is an issue that the TA cannot or should not address, then come see me to discuss those issues.
• You are responsible for the security of your work. If you use a public computer for your homework or project work, you are responsible for making sure your work is deleted from the computer or password protected so that it cannot be “borrowed” by others. Submission of the same work is clearly a violation of the honor code and will be treated as such.

Grading:

*** Homework, Projects, and Labs
1/4 Exam 1 (Wednesday, September 28)
1/4 Exam 2 (Monday, October 31)
1/4 Exam 3 (Wednesday, November 30)
1/4 Final (Thursday, December 15, 8:00am–10:50am)
(Conflict time for the Final is Saturday, December 17, 9:00–11:50am)

Exam Component: There will be three exams during the semester and a comprehensive final exam. You must take all four exams, and no scores will be dropped. No makeup exams will be given under any circumstances!

If you have to miss an exam (for whatever reason), you will receive a grade of “0” for that exam unless you have a doctor’s documentation of illness or official travel documentation for Georgia Tech business.

Each exam will be cumulative in that it may include all the topics covered in class since the beginning of the semester up to exam time.

***Homework Component: Homework will be posted weekly on the course website. We will not ask you to turn HW in, so there will be no grade associated with HW. Homework is meant to be a learning tool. If you are having difficulty, find help right away — don’t wait until you fall even further behind! Good sources of help are fellow students, the teaching assistants, and your instructor. Georgia Tech also supports several tutoring programs (these are listed on the ISyE webpage).

***Lab Component: The TAs will determine the lab component of your grade. This will be based on your participation during lab. It is possible to lose points from your overall grade if you don’t do your labs.

***Projects Component: Team project grades will have both a team component and an individual component. Each team member will be required to provide an assessment of the performance of other team members. It is possible to lose points from your overall grade if you don’t do your projects.
Regrade Policy: If you believe that there has been an error in marking an exam or project, you must bring it to our attention immediately. No regrade requests will be accepted more than one week after a paper has been returned to the student. To turn in something for a regrade, do not write on the original. Instead, go to my website and get a Grade Grovelling form stating what you want regarded and why; and turn this in with the original. In order to minimize superfluous regrades, if it is found that no additional points should be given to you, then 4 points will be deducted from that exam or lab.

Course Outline (subject to change):

- Probability / Statistics Review (including ExpertFit) — 4 lectures
- Material and Process Flow — 3 lectures
- Queueing Theory — 4 lectures
- Simulation (including Arena) — 3 lectures
- Quality — 3 lectures
- Reliability — 3 lectures
- Ethics and History — 1 lecture
- IE in the Airline Industry — 1 lecture
- Optimization (Linear and Integer Programming) — 6 lectures
- Inventory Theory — 2 lectures