Management Information Systems
33:623:386:06

All class policies subject to change at instructor's discretion.

Quick Overview:

- **Time:** Tue-Thurs 1:40-3:00 PM (section 06)
- **Place:**
  - Usually Levin 006
  - We will have some class meetings in the Levin 005 computer lab across the hall.
- **Instructor:** Cem Iyigun
- **E-mail:** iyigun@rbs.rutgers.edu
- **Class website**: All class material, announcements and assignments will be posted on the Blackboard.
- **Office:** 245 J. H. Levin Building, Livingston Campus
- **Telephone:** (732) 445-3244;
- **Office hours:** Tentatively scheduled for
  - Tuesdays 3:00-5:00 PM.
  - By appointment
- **Text:** There is only one text, a course pack called "Operations Management" from University Publishing Solutions. The Spring 2005 edition is recommended, and the Spring 2004 edition also allowed, but not highly recommended. Do not try to use editions older than Spring 2004. See below (Textbooks info) for details on trying to use the Spring 2004 edition.
- **Software: Excel**, and the **Solver** (detailed info: www.solver.com) and **YASAI** add-ins. (detailed info: www.yasai.rutgers.edu)
- **Final exam:** To be announced.

Course Content

The core of this course is a mathematical way of approaching planning and decision-making problems arising in business and related areas.

This "mindset" is called **Management Science** (**MS**) or **Operations Research** (**OR**). Basically, the MS/OR approach involves forming (imperfect) mathematical models of business situations, analyzing these models, and then deciding on some "optimal" course of action. A key concept in this approach is to separate the analysis of a decision problem into two steps, first mathematical *modeling*, and then solution of the resulting abstract model. In this class, we will leave solution of the model up to existing computer software.

There are two key ideas in applying MS/OR: the first is modeling decision making and planning as a mathematical optimization problem with variables, and objective function, and

constraints. The second is to model uncertainty using the tools of probability theory. We will spend the first 15 regular classes exploring the first idea, and the last 10 regular classes exploring the second. We will cover a relatively small set of subtopics in each case, but try to explore them in depth so you get a better feeling for the modeling process. Note that optimization and stochastic models can be combined much more closely than we attempt in this course, but that is a more advanced topic (called *stochastic programming*)

MS/OR is most helpful in situations where quantitative information is plentiful and there are relatively few intangible or psychological considerations, making it easier to produce accurate mathematical models. It is also particularly beneficial when the decision or planning situation is complex, making it hard for managers to simply "eyeball" the decision or "fly by the seat of their pants." Such situations arise most often at the **operational** level of the management hierarchy, and progressively less often at the higher levels (tactical and strategic). Hence the application to **operations management**. "Operations management" courses at some other schools may deal more with qualitative generalities of managing business operations; this course basically focuses on the quantitative tools needed for such management.

General Information

- **Attendance**: Regular attendance is essential and will be *informally* monitored. Attendance does not *directly* affect your grade. My view is that you are supposed to be adults, and if you can learn that material without my help, I will not be personally offended. However, if you don't come to class, please don't come to office hours with questions about the material I discussed there. In severe weather, please check the Rutgers main website -- if at all possible, I will post any class cancellation or schedule change information there as soon as I can. You can also monitor WCTC AM 1450, or Rutgers INFO AM 530 for possible university closing information.
- **E-Mail List:** I may occasionally use Rutgers' RAMS mail system to post important information such as class cancellations or homework assignment corrections and hints. Please check your e-mail regularly for class announcements -- it will be your responsibility if you miss one of these announcements. RAMS uses whatever e-mail Rutgers has on file for you, which is usually your "eden" e-mail account. If you prefer to receive e-mail at another address, you must do one of the following two things.
    - Configure your eden account to forward mail by following the instructions in http://faq.rutgers.edu/content/oleksiak/html/Mail.Forward.Eden.JimiO.html.
    - Update the address Rutgers officially has on file by modifying your student record online via https://www.acs.rutgers.edu/studentdir/.
- **Questions**: Unless you have skipped class, questions are strongly encouraged during class and office hours, and via e-mail.
- **Exams** There will be **two in-class midterm** exams and **a final**. All exams will be closed book. For the midterms, you can bring a one-page "cram sheet" in your own handwriting (both sides of the paper are allowed). A two-page cram sheet (also in your own handwriting, both sides of the paper allowed) is permitted for the final. All sections of this course will have a common final exam. The final distribution of letter grades should depend on the section's final exam performance, as compared to other sections. The final will be "cumulative", covering all topics in the course. If you are

absent from an exam, you must supply documented proof of a medical or family emergency, or you will receive zero credit. I grade exams myself.

- **Homework:** I am planning on **9 (or 10) homework** assignments. Typically, homework assignments will be handed out on Thursday, and due in class the following Thursday. There is *zero* credit for late homework (although I may make exceptions in *documented* cases of genuine medical or family emergency). I will drop your **lowest *two* assignment** scores in computing your overall homework performance, with late or missing assignments counting as a score of zero. This policy effectively allows you to skip one or two homework assignments without penalty. However, I would definitely recommend against skipping homework early in the term or planning in advance to skip more than one homework. Most homework problems will involve computer work. **Collaboration and Cheating**: You *are allowed* to seek or give help to other students on *homework* assignments. However, I have found it critical for the learning process that that you do your own computer work. While there is no formal penalty, it is not acceptable to simply watch somebody else do the work and/or hand in their files. *Collaboration of any kind is strictly forbidden on all exams.*
- **Computer Lab**: All software needed for this course is installed in the computer lab in the Levin building basement.
- **Using non-lab computers**: You may use the Levin computer lab, other university clusters, or your own computers. If the Solver does not appear on the "Tools" menu in Excel, you may have to go to "Add-ins..." and check the box marked "Solver". If Solver is not installed on your computer, you can install it from the Microsoft Office CD-ROM (you are out of luck if you have a "pirate" version of Office with no installation CD-ROM). On computers outside the lab, you will probably have to download the YASAI add-in from its website.
- **Classes in the Computer Lab:** I have tentatively scheduled some class meetings for the computer lab -- they are marked "**-- LAB**" on the class schedule.

- **Textbooks info**: There is only one text, a course pack called "Operations Management" from University Publishing Solutions. Your options for obtaining this text are:
    - Buy a new Spring 2005 edition from the Livingston bookstore.
    - Obtain a used Spring 2004 edition, but be aware:
        - You will have to adjust to the differences between the two editions quietly and for yourself; I don't want to waste a lot of class time worrying about two different course packs.
        - The material on pages 63-68 of the Spring 2005 course pack is not in the older editions. If I assign problems from those pages, you will have to borrow somebody else's course pack to do the assignment (I can't put that material on the web for copyright reasons).
        - The material on pages 98-102 has been changed. If you use are trying to use the old course pack, print and substitute the following pages
            - Page 98 (replaces page 97 of old course pack)
            - Pages 99-100 (replace page 98-99 of the old course pack; print both the "values" and "formulas" sheets of this Excel file)

- Pages 101-102 (replace pages 100-101 of the old course pack; print both the "values" and "formulas" sheets of this Excel file)

- **Bringing Books to Class**: Bring the course pack to all classes, except exams.
- **Grading**: No letter grades are assigned to individual assignments or exams, only numeric scores from 0 to 100. My plan is that your course grade will be based on your aggregate score, calculated by combining your scores on all written class work according to the following weights:

  - 25% First midterm
  - 25% Second midterm
  - 40% Final
  - 10% Homework (with zero scores for missing or late homework, but dropping your lowest score).
  - If your final is higher than your lower midterm, then the final counts 50%, and the lower midterm counts 10 percent less.

  I then rank students according to these aggregate scores, and assign grades by class rank, with some subjective judgement applied to borderline cases. Thus, the grades for all your class work are jointly "curved" once at the end of the course. Homework scores in this class have historically tended, with a few exceptions, to be in the 90's and vary much less than exam scores.**I reserve the right to make changes to the grade calculation scheme, especially the percentages allocated to each exam and to the homework.**
- The homework assignments are a significant amount of work, and I often get complaints that they count for so little a percentage of the grade. Regrettably, I have run into problems in the past when I have placed more emphasis on homework in the grading scheme. These problems occur because I allow collaboration on homework, it is very hard to police exactly how people "collaborate", and the homework grades tend to vary relatively little (average homework scores are well into the 90's most semesters). Thus I place just enough weight on homework to induce students to actually complete the assignments. Think of the homework as a critical part of the learning process: I evaluate that learning process mainly by exams, but you learn mainly through the homework (provided you don't abuse your freedom to collaborate). **Do not count on high homework scores to boost your overall grade.** You can certainly damage your course letter grade by poor or missing homework assignments, but historically, with almost all homework grades being in the 90's, you cannot typically lift your class rank very much through homework.

Projected Syllabus

For 10 classes, we will study a variety of applications of something called *linear programming*. We will spend 5 classes on a related topic called (mixed) *integer programming*. Finally, we will spend 10 classes on elementary probability modeling, using *simulation* as our main analytical tool. There are two in-class exams, and the last class of the semester will be a review session for the final exam..