OPRE 6201: Introduction to Operations Research at SOM1.217

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  Office hours: M and W 4-6pm at SOM3.408.
- Teaching Assistant: Nagihan Comez, nxc023100@utdallas.edu , SOM3.103.
  Regular office hours: M 4:30-6 pm at SOM1.217 and T 5-6:30 pm at SOM3.103.
  Pre-quiz office hours: June 20 and July 11. Exact office hours will be announced by TA at: www.utdallas.edu/nxc023100/O6201-555/O6201-555.htm.
- Course Content and Objective: Operations Research studies analysis and planning of complex systems. This course will focus on mathematical modelling. A strong emphasis will be given to model formulation. On the methodology side, Linear and Integer Programming techniques will be introduced. At the end of the course, students will have the skills to build their own formulations, to expand existing formulations, to critically evaluate the impact of model assumptions and to choose an appropriate solution technique for a given formulation.
- Prerequisites: Math 5304 or consent of the instructor.
- Text: (UTD customized copy of) Introduction to Operations Research, by F.S. Hillier and G.J. Lieberman, seventh edition, McGraw Hill, 2000.
- You are expected to arrive on time for the class. You can use laptops during the lecture to look at course notes and do course related work. E-mailing friends or surfing the Internet are not a part of the course work.
- Homeworks: There will be 3 homeworks. You may discuss homework problems with others, but you must write up by yourself with the full understanding of what you write. Students handing in identical assignments will be violating scholastic honesty regulations (Handbook of Operating Procedures Title V Chapter 49) and will not receive credit! Late homeworks are not allowed unless you negotiate with **the TA** at least one day in advance. Some homework questions come from lecture notes and others from the textbook.
  1. HW1 due Jun17. Questions (p.95: 3.4-9) and (p.98: 3.4-17) from the textbook, and questions 6, 7, 14 from section 7 of formulation.pdf.
  2. HW2 due Jul08. Question (p.179: 4.6-6a) from the textbook, questions 6, 9 from section 4 of simplex.pdf, and questions 2, 5 from section 7 of simplex.pdf .
  3. HW3 due Jul22. Question (p.633: 12.3-1a) from the textbook, questions 4, 5, 7, 9 from section 8 of network.pdf, and question 2 from section 5 of integer.pdf.
- Quiz 1: In class on June 21.
- Quiz 2: In class on July 12.
- Exam Materials: All exams are open textbook and open lecture notes. You may use a calculator although leaving quantities as fractions, additions or products is perfectly acceptable and preferable. **No cellular communication devices** (laptops, phones, etc) can be used during the exam.
- Grading: Homework 1: 15 points, Homework 2: 15 points, Homework 3: 20 points. Your overall homework grade will be calculated as $\min\{Hw1 + Hw2 + Hw3, 40\}$. Note scoring 80% in each hw, you can get 100% for your overall homework grade. Quiz1: 30 points. Quiz 2: 30 points.
- Objections to grades: You can object to your (homework) grades only **within 2 weeks** after the grades are announced. Late objections will not be considered.
- Internet: Course web page can be reached from www.utdallas.edu/∼metin/teaching.html with the password ..... .

Tentative Course Outline

1. Week 1, June 7: Chapters 1-3 of the textbook.
   (a) Origins and Impacts of Operations Research
   (b) Formulations
      i. Mathematical Models and Components
      ii. Formulation Examples
2. Week 2, June 14: Chapters 1-3 of the textbook.
   (a) Formulations
      i. Formulation Examples

   Hw1 is due: 5 pm on June 17 or earlier, give to your TA at office SOM3.103. Hw1 solutions will be posted on June 18 for your quiz study.
3. Week 3, June 21: Chapter 4 of the textbook.
   (a) Quiz 1 covering only formulations.
   (b) Simplex Solution Technique
      i. Graphical Method
4. Week 4, June 28: Chapter 4 and Section 5.1 of the textbook.
   (a) Simplex Solution Technique
      i. Algebraic Approach
      ii. Summary: Tableau Method
   (b) Special Cases of Simplex Method
      i. Nonrestricted, nonpositive variables and minimization problems
5. Week 5, July 5: Chapter 4, 8 and Section 5.1 of the textbook.
   (a) Special Cases of Simplex Method
      i. Infeasible and Unbounded Linear Programs
   (b) Network Problems and Applications
      i. Transportation and Assignment Problem Formulations

   Hw2 is due: 5 pm on July 8 or earlier, give to your TA at office SOM3.103. Hw2 solutions will be posted on July 9 for your quiz study.
6. Week 6, July 12: Chapter 8 of the textbook.
   (a) Quiz 2
   (b) Network Problems and Applications
      i. Shortest Path Problem
      ii. Minimum Spanning Tree Problem
7. Week 7, July 19: Chapter 12 of the textbook.
   (a) Software for Larger Linear Programs
   (b) Integer Programming
      i. Standard Formulation Techniques
      ii. Formulation Examples

   Hw3 is due: 5 pm on July 22 or earlier, give to your TA at office SOM3.103. Hw3 solutions will be posted on July 23 for your quiz study.