Course Information for Math 308

Instructor:	Tamon Stephen
Meeting Time:	Tuesday 9:30–11:20 in SUR 3340 and Thursday 9:30–10:20 in SUR 5140
Office:	14-265 Central City Tower
Office Phone:	778–782–7429
E-mail:	tamon@sfu.ca
Web page:	`http://www.math.sfu.ca/~tstephen/Teaching/1101_Math308/`
Office Hours:	Tuesday 11:30–12:20 and Thursday 10:30–11:20 (tentative)
Text:	<u>Linear Programming: Foundations and Extensions</u> (3rd ed.), by Vanderbei
Grading:	15% Homework, 35% Midterm, 50% Final.

1. **Syllabus.** We will cover the first 7 chapters of the text, and, as time permits, chapters 9, 10, 11, 14 and 25. Topics that we plan to cover include:

   Introduction: Examples - formulation of optimization problems as linear programming problems.

   The Simplex Method: Initialization. Unboundedness. Degeneracy and cycling.

   Duality Theory: The dual simplex algorithm. Complementary slackness. The duality theorem.

   Sensitivity and Parametric Analysis.

   Problems in General Form.

   Software and Large Scale Problems.

   Additional topics as time permits: Convex sets and polyhedra. Game theory (linear programming formulation of matrix games). Transportation and assignment problems. Network simplex. Lagrange multipliers. Convex minimization.

2. **Homework.** There will be six homework assignments during the term. Late homework will not be accepted.

   You are encouraged to talk with each other, the teaching assistants and the instructor about the homework, but you must write up the solutions yourself, using your own words.

3. **Exams.** Books, notes and calculators cannot be used on these tests. Students **must** plan to take the tests at their scheduled times.

   The tentative dates and times for the tests are:

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   Midterm: Tuesday, March 9th, 9:30-11:20 AM  (in class)
   Final: Tuesday, April 27th 12:00-3:00 PM
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4. **Reading.** There will be assigned reading. Please do it.

5. **Materials on the Web.** Some basic course information will be available on a public Web page:
   `http://www.math.sfu.ca/~tstephen/Teaching/1101_Math308/`

6. **Drop Dates.** The drop date for students to avoid getting a WD on their transcript is **Friday, January 22nd**. The final drop date for students is **Friday, February 5th**. SFU maintains a list of important deadlines for students at:
   `http://students.sfu.ca/deadlines/`.

7. **Reserve Books.** There is a copy of the course text on reserve at the SFU Surrey library. There are several other textbooks that cover similar material with different perspectives and levels, and several are on reserve. A classic textbook is *Linear Programming* by Chvátal. *Linear Programming and Network Flows* by Bazaraa, Jarvis and Sherali is a more recent competitor to the course text, but slightly more difficult. *Theory of Linear and Integer Programming* by Schrijver and *Introduction to Linear Programming* by Bertsimas and Tsitsiklis are excellent advanced textbooks, the latter is used for the graduate version of this course.

   On the lighter side are *Linear Programming and Its Applications* by Strayer (but beware non-standard notation), *Linear and Non-linear Optimization* by Griva, Nash and Sofer, *Linear Programming* by Vaserstein and *Elementary Linear Programming* by Kolman and Beck.

8. **Software.** This course focuses on the theory of linear programming. However, there may be a few exercises on the assignments where you are asked to formulate and solve a problem in a common software package, such as Excel or MATLAB.

9. **Industrial Mathematics and Operations Research.** Linear Programming is a powerful tool that is used in many applications in business and industry. As such, it is a key course in the Industrial Mathematics program offered at SFU, and is particularly central to the new Operations Research and Applied Statistics option. Please see the instructor if you are interested in finding out more about this program.

10. **Questions.** Questions are encouraged in class and out.

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Have a great term!

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