Course Information for Math 208W

Meeting Time:	Wed. 11:30–12:20 in WMC 3220 and Fri. 10:30–12:20 in WMC 2810
Instructor:	Tamon Stephen
Office:	2886 Podium 2 (Surrey), tentatively P9322 (Burnaby)
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Web page:	`http://www.math.sfu.ca/~tstephen/Teaching/1191_Math208W/`
Teaching Assistant:	Shawn Yan, shanweny at sfu ca
Tutorial:	Tuesday 3:30–4:20 in BLU10921.
Office Hours:	TBD.
Text:	*Optimization Modeling with Spreadsheets*, 3rd ed., by K. R. Baker.
Grading:	40% Assignments, 15% Midterm, 25% Final Exam, 20% Final Project.

1. **Syllabus.** Introduction to methods of operations research: linear and nonlinear programming, simulation, and heuristic methods. Applications to transportation, assignment, scheduling, and game theory. Exposure to mathematical models of industry and technology. Emphasis on computation for analysis and simulation.

2. **Details.** Modelling problems with many variables as linear programs. Using spreadsheet applications to solve these models. Network flow models. Sensitivity analysis. Integer and non-linear models. Applications may include resource allocation, shipping and financial planning.

   Modelling problems using discrete-event simulations. Random numbers and distributions. Queueing theory.

   Students will learn mathematical typesetting using LaTeX, and spreadsheets using `Excel`. A feature of this course will be a team project, in which students analyze a substantial mathematical problem and present their results in writing and in a formal presentation.

3. **Course Requirements.** There are three components to the evaluation of this course. The largest one will be five individual written assignments. These assignments will involve a range of skills, including writing, mathematical modelling and demonstrating proficiency in software.

   There will be an in-class midterm and a final exam.

   Finally, students will produce projects, in which they will produce an extended mathematical analysis of a topic of current local interest using real data. These will be presented in the final week of class, on **Wednesday, April 3rd** and **Friday, April 5th**.

4. **Participation.** Since this class is based on group work, attendance and punctuality in class are critical, as well as active participation in group activities. These will be considered when assigning project grades.

5. **Tests.** 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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   Friday, March 8th, 10:30--12:20 (in class)
   Friday, April 12th, 3:30--6:30 (location TBA)
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6. **Assignments.** The assignments in this class will require detailed, well written mathematical models, and their solutions. You may at times be asked to provide computer code, or give a brief presentation on your model and solution. Assignments will be typeset in LaTeX.

7. **Projects.** Full details for the main projects will be handed out soon. The plan is to do them in groups of 3 or 4. We should form the groups in the January, and have topics selected before Spring break (which begins on February 18th).

   Selected past Math 208W projects have been published in the journal *Analytics Now*, published by the SFU Operations Research Student Union. There are currently three issues, representing projects from 2012, 2013/14 and 2015/16 respectively. Copies of these are on reserve at the library and available on-line at `http://journals.lib.sfu.ca/index.php/analytics-now/index`. This can help you get an idea of what these projects should look like.

8. **Religious Accommodations.** Students requesting religious accommodation must tell the instructor by the end of the first week of term.

9. **Resources.** There is a copy of the course text available on reserve at the Bennett library. You can also access it on the Web through SFU. This requires your userid and password if you are off campus.

   Course notes by T. Yusun and myself will be provided on Canvas for the second half of the course.

   Also on reserve, as mentioned as mentioned above, are the three editions of *Analytics Now*. Additional resources on modelling for Operations Research are Hillier and Lieberman's *Introduction to Operations Research*, Sarker and Newton's *Optimization Modeling: A Practical Approach*, Winston's *Operations Research: Applications and Algorithms* and Rader's *Deterministic Operations Research: Models and Methods in Linear Optimization*. All these books are on reserve at the library, along with two books that can help with LaTeX.

   Some non-technical presentations of very large scale Operations Research projects are available through the Edelman Awards of INFORMS (Institute for Operations Research and Management Science). These are found in the INFORMS Video Learning Center, under the corresponding year's Analytics Conference, where the awards are presented.

   The INFORMS Journal on Applied Analytics (formerly *Interfaces*) publishes papers on the practice of operations research. These are generally quite readable and may give you some ideas for potential project topics. You can access the journal through the SFU library using student Internet credentials.

10. **Software.** We plan to use software throughout this course. You will be required to gain proficiency in LaTeX, spreadsheets and perhaps some additional software packages.

11. **Tutorials, office hours and support.** The main function of the tutorials will be an opportunity for you to discuss the material with the Teaching Assistant, you are encouraged to bring questions. I am happy to arrange to meet students for office hours, we should discuss whether this is best done by appointment or at a regular time. By the way, as this is a writing course, it is an excellent place to practice writing professional e-mails.

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