

Course Information for Math 208W

Meeting Time:	Wed. 11:30–12:20 and Fri. 10:30–12:20 (remote)
Instructor:	Tamon Stephen
E-mail:	tamon at sfu ca
Office Hours:	Thursday 3:30 (tentative).
Teaching Assistant:	Miriam Sroková, msroкова at sfu ca
Tutorial:	Tuesday 3:30–4:20 (remote)
Web page:	http://www.math.sfu.ca/~tstephen/Teaching/1211_Math208W/
Text:	<i>Optimization Modeling with Spreadsheets</i> , 3rd ed., by K. R. Baker.
Grading:	35% Individual Homework, 15% Team Homework, 10% Midterm, 20% 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 work, including a project in which students analyze a substantial mathematical problem and present their results in writing and in a formal presentation.
- 3. Course Requirements.** The course includes 5 individual homework assignments and 3 team homework 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, there will be team projects, in which teams 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 14th** and **Friday, April 16th**.
- 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 midterm is tentatively scheduled for Friday, March 5th, 10:30–12:20 (in class). The final exam will take place during the exam period as scheduled by SFU. The plan for the exams is to run them live over **Zoom**, following SFU's guidance for invigilation. Should the guidance be updated or the software prove inadequate, we may explore other alternatives for proctoring.

6. **Assignments.** The assignments in this class will require detailed, well written mathematical models, and their solutions. This may include a software component. Individual homework will also have an essay component.

Assignments will be typeset in L^AT_EX. Submission will be via **Crowdmark**.

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 by the end of the month. Initial proposal will be present in class in the week before Spring Break, on February 10th and 12th.

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.** The course text is available on-line, you can 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 simulation part of the course.

An textbook that covers similar ground is Sarker and Newton's *Optimization Modelling: A Practical Approach*, also available on-line through the library. We may refer to it occasionally.

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 Library.

The INFORMS Journal on Applied Analytics 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 L^AT_EX, spreadsheets and perhaps some additional software packages.

11. **Tutorials, office hours and support.** Tutorials begin in the second week of class on January 19th. There may be a certain amount of material covered in the tutorials. They will also be an opportunity for you to discuss the material with the Teaching Assistant. You are encouraged to bring questions. I plan to hold an office hour, tentatively on Thursdays at 3:30 p.m., in the class Zoom room.

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

Have a great term!