Course Information for Math 402W (Spring 2023)

Meeting Time:	TTh 10:30–12:20 in WMC 3511
Instructor:	Tamon Stephen
E-mail:	tamon@sfu.ca
Web page:	`http://www.math.sfu.ca/~tstephen/Teaching/1231_Math402W/`
Office Hours:	By appointment.
Text:	None.
Grading:	10% Article Review, 90% Final Project.

1. **Syllabus.** This course is centered around a group project. The objective is to model and analyze real-world problems that require substantial mathematical (Operations Research) techniques. Students will select the problems and present their analyses in written reports and oral presentations.

2. **Course Requirements.** The main requirement for the course is the successful completion of the main group project, worth 90% of the final grade. There will also be an article review, worth 10%, which will be done individually.

   Note that class does not follow a lecture format. Students are required to attend, and will meet in their groups and with the instructor during the class meeting times.

3. **Class Meetings.** Class meetings are expected to take place Tuesday and Thursday 10:30-12:20 in WMC 3511. You **must** attend the meetings. These will not be lectures, but rather time for us to discuss the course material and for students to ask questions.

4. **Exams.** There are no tests or exams in this class.

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

6. **Timeline.** The main group projects will begin immediately. Topics should be established by Thursday, January 19th. Detailed proposals are due Thursday, January 26th. There will be a progress report on Thursday, February 9th. Note that reading week is February 20th to 24th. You should submit a draft document for feedback in mid-March. The final reports are due on the final day of class, that is, Tuesday, April 11th. The in-class presentations will take place on Thursday, April 6th and Tuesday, April 11th.

7. **CORS Student Paper Competition.** Since 2012, students have been submitting high-quality projects to the CORS (Canadian Operational Research Society) undergraduate student paper competition. At least one SFU team has been selected for the finals 10 out of 11 years, including 4 first prizes and 5 honourable mentions.

   If the projects look promising, we may be able to submit them to the 2023 competition. Note that to do this, as described in the application procedure, you must indicate your intent to participate at the start of March and submit the final paper at the end of March (dates to be finalized). The CORS deadline is *before* the end of our term. To have a competitive entry, you will need to have the paper portion of

the project substantially complete by this time. You should consider this to be the effective deadline for the paper.

This year's CORS conference is scheduled for Montreal **May 29th** to **31th**, 2023.

8. **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 grades.

9. **Resources.** There are many references on Operations Research methodology and techniques, you will have to find suitable references as part of your project.

   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 Operations Research Student Union publishes a booklet called *Analytics Now* containing past Clinic projects, as well as some from the Math 208W Introduction to Operations Research course. Recent versions are also available as an on-line journal at this link, the booklets, which go back to 2012, may be available from the library if you request them.

   For papers that present Operations Research cases along with substantial technical details, see the Journal of the Operational Research Society (of the U.K.). One of these papers will the be the subject of your article review. You will need to access the journal through the SFU library using student Internet credentials. Another good source of general less technical presentations of successful operations research projects is the INFORMS Journal on Applied Analytics.

10. **Research Ethics.** One of the goals of this course is to get you to work with real data. In some cases, this data will be public data that will not present ethics issues. However, if you are considering obtaining or generating non-public data, you will want to consider carefully how your data will be handled and published. In that case, we will go through SFU's ethics approval process.

    If your group is interested in working with this type of data, please talk to me about it as soon as possible so we can begin the approval process. Some information on research that requires ethical review is available here. In particular, you will have to complete the TCPS 2: CORE-2022 tutorial.

11. **Software.** Your optimization models will not be easy to solve, so you will need to access to current mathematical software. This will be arranged with the instructor, using educational software licences.

12. **Typesetting.** LaTeX is recommended for simple conversion to journal submission. In particular, I suggest using `Overleaf`. SFU has an institutional subscription, which you can use by including your institutional (SFU) address as an address on your account.

13. **Overleaf blogs.** Once the groups are formed they should post brief notes summarizing their discussions and progress on a blog on `Overleaf`. Scribe duties will rotate between the members, and blog entries will be included as part of your assessment.

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