Alberta School of Business
Department of Accounting, Operations, and Information Systems

Operations Management 422/622
Simulation and Computer Modelling Techniques in Management

Winter Term 2019

Instructor: Dana Marsh
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Office Hours: By appointment
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Lectures: Tuesdays, 6:00-9:00, in BUS B-28. There will be no lecture on February 19 (reading week).

Required Textbook: There is no required textbook for this course

Optional Textbook: Chapters about simulation in *Practical Management Science* by Winston and Albright (textbook previously used in OM352; used / older editions are OK).

Software: We will use MS Excel and the @Risk add-in during the first half of the course and RStudio during the second half of the course. Both software packages are available in BUS B-18, B-24 and 28. Students will also be able to download student versions of @Risk—see instructions on eClass. All assignments and projects will be designed so that they can be completed using the student versions. Note this software only runs on the Windows operating system.

Computer Lab: Students in OM 422/622 will have priority in BUS B-28 from 3:00pm to 5:00pm on Mondays. Any known exceptions will be posted on the course web.

OM 422 Official course description: Computer modelling of management systems in such functional areas as accounting, finance, marketing and operations. Basic concepts of deterministic and probabilistic (Monte Carlo) simulation and their applications. Microcomputer implementation of case studies using spreadsheets particularly emphasized. Required term project. Prerequisites: MGTSC 312 (or equivalent STAT course), MGTSC 352 or OM 352; and FIN 301 or ACCTG 311. Not to be taken by students with credit in MGTSC 422.

OM 622 Official course description: This course will discuss computer modelling of management systems in such functional areas as accounting, finance, marketing, and production. Basic concepts of deterministic and probabilistic (Monte Carlo) simulation and their applications will also be covered. Micro computer implementations of case studies using spreadsheets will be particularly emphasized. A term project will be required. Prerequisite: MGTSC 502 or OM 502. Not to be taken by students with credit in MGTSC 632.

Overview of material:
- **Introduction**: Simulation with MS-Excel, review of relevant material from statistics, random number generation.
- **Monte Carlo Simulation**: Use of the @Risk Excel add-in, applications in finance, marketing, operations, and project management.
- **Discrete Event Simulation**: Use of the R programming language, animation, applications in manufacturing and service operations.

Skills you should have at the end of the term:

- Be able to analyze situations that involve uncertainty, such as:
    - Ordering when demand is uncertain, capacity when demand is uncertain, value of financial options, how much to save for retirement, etc.
- Specify distributions for inputs
    - Cost, revenue, demand, supply, rate of return, etc.
- Generate distribution for outputs
    - Profit, average waiting time, rate of return, etc.
- Use software that is appropriate to the task

Evaluation:

- Assignments: 30% (4-6 assignments)
- Group projects: 30% (2 projects, 15% each)
- Quizzes: 40% (2 quizzes, 20% each)

Both quizzes will be online and in-class. To pass the course, a student must obtain an average of at least 40% on the two quizzes.

Final grades will be based on the overall class performance. The class average for OM 422 has historically been between 3.0 and 3.2.

Further instructions for the two group projects will be available from eClass before the end of January. Both projects will require a written report or memo as well as a computer model.

Students in OM 622 will be graded separately from students in OM 422.

Group Work: The two course projects are to be completed in groups of 3 to 4. One purpose of the group work is preparation for working on teams after graduation. In the working world, people typically don't get to pick who they work with, and managers who form groups don't do so randomly. Therefore, we will form the groups. Our primary goal in forming the groups will be to have approximately equal prior useful background (for example, prior courses on related subjects). Requests from students to be in a group with another student will be accommodated as long as doing so does not conflict with the primary goal. MBA student groups will be separate from BCom student groups as long as the final enrolment numbers support this.

Learning Outcomes: This course incorporates the Learning Goals of the BCom program, in particular:

- Quantitative Skills – throughout the course, you will learn new tools for solving quantitative problems, while also learning the technical limitations of those tools.
- Written Communication – homework assignments, quizzes, and projects will all have a written component, where you will be challenged to communicate ideas in a clear and concise manner, with proper report structure and grammar, and with the right tone and technical level for the intended audience.
- Teamwork – project work will be completed in groups, giving you an opportunity to exercise your teamwork skills.

There is a similar set of MBA learning goals, which also align with this course.

Academic Misconduct: The University of Alberta is committed to the highest standards of academic integrity and honesty. Students are expected to be familiar with these standards regarding academic honesty and to uphold the policies of the University in this respect. Students are particularly urged to familiarize themselves with the provisions of the Code of Student Behaviour (online at http://www.governance.ualberta.ca) and avoid any behaviour which could potentially result in suspicions of cheating, plagiarism, misrepresentation of facts and/or participation in an offence. Academic dishonesty is a serious offence and can result in suspension or expulsion from the University.

Students who commit any act of plagiarism, cheating, or misrepresentation in this course will be penalized. All assignments (except for the group projects) are to be completed individually. However, we recognize the value of studying together and comparing notes when working on assignments. To help you judge what we consider acceptable and non-acceptable collaboration, consider the following:

Do:

- Discuss the course material with other students.
- Ask classmates for help when you are stumped.
- Offer help to other students.
- Do your own work.

Don't:

- Discuss numerical answers with other students.
- Use someone else's words without proper attribution.
    - The best way to avoid using another student's words is to never look at another student's written answers to an assignment.
    - If you cite an article, book, web page, or any other source in your project report, then you must include complete information about that source.
- Copy another student's spreadsheet file, R code, or other computer file.
    - There are no exceptions to this rule. Copying another student's file for an assignment (or another group's work, for the group project) is not acceptable, under any circumstances. It is immaterial whether the copying is done electronically or manually.

If you have any questions, talk to the instructor. We'll happily clear up any ambiguity.

Marking and Grade Disputes: The instructor will be available to discuss with students their concerns about grading and marking. Policies regarding appeals and late penalties for assignments, projects, and quizzes will be posted on eClass.

Students who require accommodations in this course due to a disability affecting mobility, vision, hearing, learning, or mental or physical health are advised to discuss their needs with Accessibility Resources, 1-80 Students' Union Building, arrec@ualberta.ca, phone 780-492-3381.

In the case of a dispute over a final grade, the student is required to discuss the matter first with the instructor. If the student remains unsatisfied, they may discuss the dispute further with the Department Chair. Should the student still be unsatisfied, the matter may be taken to the Assistant Dean, Undergraduate or the Associate Dean, MBA, as appropriate.

Audio or video recording of lectures, labs, seminars or any other teaching environment by students is allowed only with the prior written consent of the instructor or as a part of an approved accommodation plan. Recorded material is to be used solely for personal study, and is not to be used or distributed for any other purpose without prior written consent from the instructor.

Policy about course outlines can be found in §23.4(2) of the University Calendar.