

**FRE 385/585**  
**Quantitative Methods for Business and Resource Management**  
**University of British Columbia**  
**Jan, 2016**

**Instructor:** Michael Johnson

**Contact Info:**

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**Office Hours:** Tuesdays 5:00 to 6:00pm (Room: McMI 231)

**Lectures:** Tuesdays and Thursdays, 3:30 – 5:00, FNH 40

**Labs:** Thursdays 5:00 – 6:00pm Room 192 MacMillan

*Labs are completely optional and are available to provide extra help in this course. The computer lab will be attended by our teaching assistant for this course.*

**Teaching Assistant:** Gabrielle Ménard    **Email:** gabrielle.menard@ubc.ca

**Course Website:** [elearning.ubc.ca/connect](http://elearning.ubc.ca/connect)

**Course Overview**

This course will provide the necessary foundation and experience for students to apply a variety of modeling and quantitative techniques to business and resource management problems. This class will concentrate on frequently used quantitative and decision making models that include decision analysis, optimization such as linear programming (allocation and scheduling of resources), simulation modeling, operations analysis and inventory management. Upon completing this course, students will be capable of using a powerful set of functions and tools in Microsoft Excel for solving a broad range of quantitative problems.

**Textbooks:**

1. Pre-midterm: On course reserve at Woodward's Library: "Spreadsheet Modeling & Decision Analysis: A Practical Introduction to Management Science", 6<sup>th</sup> edition, 2012 by C. Ragsdale.
2. Post-midterm: Selected readings and the "Essentials of Operations Management", 6<sup>th</sup> edition, 2010 by Nigel Slack, Alistair Brandon-Jones and Robert Johnston.

**Required Calculator:**

Any scientific calculator. Programmable calculators are not allowed during examinations.

**Attendance: Required**

Attendance is mandatory at ALL classes. The course will be conducted using a Team-Based Learning (TBL) format, to develop both your leadership and team-building skills, while enhancing your learning beyond individual study. Missing class will be detrimental to your grade.

**Grading:**

	<b>FRE 385</b>	<b>FRE 585</b>
Individual Assignments	15%	15%
TBL: Individual and Team Tests TBL: Weekly Team Activities	5%	5%
Participation	10%	10%
Midterm	30%	25%
Final Exam	40%	30%
Individual Project Assignment*		15%
Total =	100%	100%

\* Details to be announced

**“Getting to know you” Assignment (385 students Only):** Please complete this first Assignment and hand it directly to Mike during our next class. Late assignments will not be accepted (hard copy only - **not** emailed).

**Assignments:** Late submissions will be accepted up to 24 hours late but will be penalized 50%. Any assignment submitted beyond that point will not be graded. Assignments must be done on an **individual basis unless otherwise specified by the instructor**. **Discussion and collaboration among students is *strongly* encouraged, but on individual assignments, each student must build his or her own computer file and submit his or her own original work. Identical submissions are a form of academic dishonesty and will immediately receive a mark of zero and possibly infringe upon your academic record.**

Your assignments should be presented with the same quality as you would a piece of business correspondence to your customer or your boss. The **neatness and quality** of your submission will contribute to your marks. **All assignments must be submitted using the posted title page that can be downloaded from Connect in the “Assignment” folder.**

**Makeup Exams or Tests:** There will be **NO** makeup tests, exams or quizzes. **If you miss an exam, you will receive zero marks.** Exceptions may be considered for documented medical reasons from UBC’s Health Services or extenuating circumstances. In such a case, it is the responsibility of the student to inform the instructor immediately by phone only (**not after the exam has taken place**). Notification after the examination date is not acceptable and will result with a grade of zero.

**All TBL tests (both Individual and team-based tests) and Midterm and Final exams are “closed-book”. That is, you will NOT be allowed to use your textbook or notes. Formulas will be provided on the front page of the exam.**

**UBC STUDENT PHOTO ID is required in order to write any exam.**

**Please bring your UBC student card and one other piece of photo ID to all exams.**

**Topics (Tentative Schedule): \*\*\*\* please note: subject to change at the discretion of instructor!**

Date	Topic	Text Reference
<b>Week 1</b> Jan 4	Introduction to the course (Model Building).	Ragsdale: Chapt. 1
<b>Week 2</b> Jan 11	<b>Decision Analysis:</b> Excel, Descriptive Stats Review, Maximax, Maximin, EMV, EOL, Minimax Regret, EVPI, Decision Trees.	Any Intro Stats text, Ragsdale: Chapt. 14 – sections 14.1 to 14.9
<b>Week 3</b> Jan 18	<b>Decision Analysis:</b> Complex Decision Trees, Building Decision Trees in Excel (Treeplan.xla), Sensitivity Analysis (Data Tables)	14.10 to 14.12
<b>Week 4</b> Jan 25	<b>Decision Analysis:</b> Bayes Theorem and applications, Multi-criteria decision making, Analytic Hierarchy Process, Monte Carlo Simulation	14.13, 14.14, 14.16 to 14.18. Ragsdale: Chapt 12 – Monte Carlo
<b>Week 5</b> Feb 1	<b>Optimization Techniques:</b> Introduction, Linear Programming-concepts; formulation of 2-variable problem; graphical solution; interpretation of graphical results including sensitivity analysis.	Ragsdale: Chapt. 2
<b>Week 6</b> Feb 8	<b>Optimization continued:</b> Modeling LP using Excel, formulation of multi-variable LP application. Computer solutions. Interpretation of Business results from computer output (sensitivity analysis). Linear Programming extensions: Transportation, assignment, network, integer models.	Ragsdale: Chapt. 3 and 4 (possibly materials from Chapters 5, 6 and 7)
	<b>Reading Break: Feb 15-19</b>	
<b>Week 7</b> Feb 22	<b>Midterm Exam (2 hours): Thurs Feb 25<sup>th</sup> from 3:30 – 5:30pm</b>	
<b>Week 8</b> Feb 29	<b>Operations Management:</b> Introduction to operations management; Ford; Systems Thinking. Business Process Design and Process mapping.	Chapt 1 (Slack) Chapt 4 (Slack) Process Mapping for SOX
<b>Week 9</b> Mar 7	Operations analysis applied to service organizations (throughput capacity, demand and process variability, capacity utilization and service time). Simulation: Operations Management Simulation: Benihana V2.	HBS case: Benihana of Tokyo (HBS: 9-673-057) 2004
<b>Week 10</b> Mar 14	Inventory and Supply Chain Management: Basic inventory models: EOQ, trade-offs between costs; reorder points; quantity discount models.	Handout: "Chapter 13 - Inventory Control Models.pdf"
<b>Week 11</b> Mar 21	Probabilistic models; reorder point with probabilistic demand, Newsvendor model. Simulation Game: Supply Chain Management	Handout
<b>Week 12</b> Mar 28	Debrief Simulation Game. Lean Operations. Understanding bottlenecks and Process Flow.	Chapt 15 (Slack)
<b>Week 13</b> Apr 4	Course Wrap Up.	