

**COMM 393.3 (01 & 03)**

**Spreadsheet Modelling for Business Decisions**

**Course Syllabus**

**2020/21 Term 1**

The Edwards School of Business develops business professionals to build nations.

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| **OFFICE HOURS** | By appointment, using WebEx |
| **CLASS TIME LOCATION** | Tu & Th, (01) 2:30-3:50 pm, (03) 4:00-5:20 pm  https://usask.webex.com/meet/hojati |

When we gather at the University of Saskatchewan Saskatoon campus, we acknowledge that we are on Treaty 6 Territory and the Homeland of the Métis. We pay our respect to the First Nations and Métis ancestors of this place and reaffirm our relationship with one another.

**Course Description**

This course is about modelling business problems to help managers make better decisions, regardless of their functional areas. It introduces you to analytical decision-making tools including optimization (linear programming, network models, integer programming, nonlinear programming), decision analysis, and simulation. We will use Microsoft Excel, the Solver add-in, and DecisionTools add-ins from Palisade.

**Note:** DecisionTools only runs on Windows. If you have a MacBook/Apple computer, you will need to use the virtual lab (vlab) at ESB for the 5 sessions, 1 assignment, and midterm exam 2 that use DecisionTools. Vlab uses the computers in room 112 of ESB through remote access.

**B. Comm. Program Learning Goals**

The icons below represent the goals we expect all students who graduate from the Bachelor of Commerce program to achieve. The learning outcomes for this course are connected to these broader goals.

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| --- | --- | --- | --- | --- | --- |
| BKnowledgeIcon.png  Icon2.png | **Disciplinary Knowledge**  *Be competent in a discipline specific area.*  **General Business Knowledge**  *Be competent in the general field of business.* | TeamIcon.png | **Teamwork skills**  *Be effective contributors to team performance.* | Icon3.png | **Discovery**  *Be effective decision makers and problem solvers.* |
| CommunicationIcon.png | **Communication skills**  *Be effective written and oral communicators.* | IntegrityIcon.png | **Integrity**  *Incorporate ethical considerations into decision making and intended actions.* | CitizenshipIcon.png | **Citizenship**  *Be engaged contributors to society.* |

**Course Objectives**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *By the end of this course, you will be expected to be able to:* | | **AOL Learning Objectives** | | | | | | |
| ***Disciplinary*** | ***General*** | ***Communication*** | ***Teamwork*** | ***Integrity*** | ***Discovery*** | ***Citizenship*** |
|  |  |  |  |  |  |  |
| 1 | Receive and understand a decision problem, identify the variables to be determined, the objective, and the constraints | x | x | x |  |  | x |  |
| 2 | Formulate the problem in Excel: put data inputs at the top, variables in the middle, and relationships and constraints in the bottom | x |  |  |  |  | x |  |
| 3 | Use formatting and cell background colour to make the worksheet model easy to understand | x |  |  |  |  | x |  |
| 4 | Identify the problem-solving approach and select the software tool | x |  |  |  |  | x |  |
| 5 | Know how to choose between Simplex, Nonlinear, and Evolutionary Solver methods | x |  |  |  |  | x |  |
| 6 | Understand network models and how they differ from linear programming models | x |  |  |  |  | x |  |
| 7 | Understand simulation and how to use Excel to simulate | x |  |  |  |  | x |  |
| 8 | Know how to use @Risk software for simulation | x |  |  |  |  | x |  |
| 9 | Understand decision analysis and how to run PrecisionTree software for decision analysis | x |  |  |  |  | x |  |
| 10 | Possibly reformulate the model to fit the method and software | x |  |  |  |  | x |  |
| 11 | Run the software and validate the results | x |  |  |  |  | x |  |
| 12 | Debug the model if necessary and rerun | x |  |  |  |  | x |  |
| 13 | Make recommendation to the decision maker | x |  | x |  |  |  |  |

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| **Grade Distribution** | |  | Course Learning Outcomes | Program Learning Goals |
| Homework assignments (6\*) | | 30% | 1, 2 | **BKnowledgeIcon.png** Icon3.png Icon2.png |
| Midterm Exams (2), 20% each | | 40% | 1, 2 | **BKnowledgeIcon.png** Icon3.png |
| Final Exam | | 30% | 1, 2 | **BKnowledgeIcon.png** Icon3.png |
| Total | | 100% |  |  |
| **Prerequisite**  **Textbook Recommended** | \* may have unequal weights  COMM 205  *Practical Management Science*, 6th edition Winston and Albright, 2019, Boston: Cengage, ISBN: 978-0-357-11674-6 with MindTap | | | | |
|  |  | | | | |
| **Class Preparation & Blackboard (Course Tools)** | This course is entirely workshops. I will prepare video recording of each workshop and make it & Excel file(s) available to you 2 days before class on Blackboard (Course Tools). During class I will review the workshop while answering your questions. You may use MindTap, the online leaning resource provided by the publisher, Cengage. This includes video tutorials, example files, problem files, the ebook, etc. Go to cengage.com/login, create an account, and log in to our course using Access key MTPP-SRCQ-PFCF. | | | | |
| **Contacting Me** | If you need assistance, speak to me after class or email me. | | | | |
| **Proper Business Use of Email** | Always use your PAWS/University of Saskatchewan email account (e.g., [abc123@mail.usask.ca](mailto:abc123@mail.usask.ca)). | | | | |
| **Homework Assignments** | There will be 6 homework assignments. They are usually due at 9 pm on the day specified on the following course schedule. Submit the completed assignment to Course Tools. Complete the assignments individually. Copying another student’s assignment will result in 0 for both sides. | | | | |
| **Midterms and Final Exams** | Exams consist of model building problems using Excel. You will download the problem file from Course Tools, build the models, and then submit the completed workbook to Course Tools. Date of the midterm exams (see the following schedule) cannot be changed. | | | | |
| **Optional Term Paper**  **Policy regarding Late Assignments and Midterm Exam** | To replace 20% of class grade, an individual can study and document how an organization uses Excel (including who uses it and what they use it for), and suggest opportunities for improvement (using it more and more effectively), including use of optimization, simulation, and decision analysis for decision making. The organization will be selected by you, and the relevant persons are interviewed. The complete paper, including printout of Excel worksheets, is due by the date of the final exam.  No late homework assignment will be accepted. If a midterm exam is missed due to a medical reason, its weight can be transferred to the final exam provided it is supported by a document. | | | | |
| **Final Exam Schedule** | The final exam will be scheduled by the Registrar’s office. It will be posted on PAWS, and an email will be sent to all students once the exam schedule has been finalized. Term 1 final exams will be held from Dec 8 to Dec 23. Avoid making prior travel, employment, or other commitments for this entire period. Registration is a commitment to accept exam dates. | | | | |
| **Deferred Exams** | A student who is absent from a final exam for medical, compassionate, or other valid reasons, may apply to the ESB office for a deferred exam. Such application must be made within 3 business days of the missed exam and be accompanied by a supporting document. Please see <https://students.usask.ca/academics/exams.php> for further information. | | | | |
| **Grading System** | The University of Saskatchewan uses a percentage system for reporting final grades. For more information, see <http://students.usask.ca/academics/grading/grading-system.php> | | | | |
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**Academic Accommodation**

Access and Equity Services (AES) offers services to students with documented disabilities ranging from learning deficiencies and disabilities, chronic health issues, hearing and visual impairment, disabilities and temporary impairment due to accident, illness or injury. It is the student's responsibility to request an academic accommodation. If you are a student with a documented disability who requires academic accommodation, please register with AES. Students who have not registered with AES are not eligible for formal academic accommodation. More information is available in <https://students.usask.ca/health/centres/access-equity-services.php>

**Academic Honesty**

Academic honesty is the cornerstone in the development of knowledge. A single offence of cheating, plagiarism or other academic misconduct in exams or assignments can lead to disciplinary probation, suspension, or expulsion from the University. This includes copying from others. However, for joint assignments just hand in one copy. Every student is expected to have read and understood the rules regarding student academic dishonesty available at: <https://secretariat.usask.ca/student-conduct-appeals/academic-misconduct.php>

**Copyright**

See <https://library.usask.ca/copyright/>

**Counselling Services:**

Dealing with stress, loneliness, and anxiety can be challenging. Professionally trained counselors with backgrounds in clinical psychology and social work are available in Student Counselling Services to provide advice, counseling and consultation at no cost to registered students. Any personal information shared with these professionals is treated with great care and utmost confidentiality. See <https://students.usask.ca/health/centres/wellness-centre.php>.

**Freedom of Information and Protection of Privacy:**

See <https://privacy.usask.ca/>

**University Learning Charter:**

See <http://teaching.usask.ca/about/policies/learning-charter.php>

**University Academic (event) Calendar:**

Important dates can be found in: <http://www.usask.ca/events/month.php?cal=Academic+Calendar>

**COURSE SCHEDULE**

**Subject to minor changes**

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| --- | --- | --- | --- | --- | --- |
| **Session** | **Date** | **Topic** | **Chapter (pages)** | **Problems** | **Due dates** |
| 1 | **Sep**  3 Th | Introduction | Ch1 (1-16) |  |  |
| 2 | 8  Tu | Excel review 1 |  |  |  |
| 3 | 10  Th | Excel review 2 |  |  |  |
| 4 | 15  Tu | Excel review 3 |  |  |  |
| 5 | 17  Th | Spreadsheet modelling | Ch 2 (19-25, 31-36) | Ordering T-shirts,  Breakeven analysis | HW1  9 pm |
| 6 | 22  Tu | Spreadsheet modelling (cont’d) | Ch 2 (39-43, 54-58, 64-65) | Quantity discounts,  Calculating NPV |  |
| 7 | 24  Th | Optimization modelling | Ch 3 (71-86) | Product mix: algebraic model, graphical solution, Excel model Solver |  |
| 8 | 29 Tu | Optimization modelling (cont’d) | Ch 3 (87-90, 97-101, 111-116) | Product mix: sensitivity analysis, Multi-period production |  |
| 9 | **Oct**  1 Th | Linear programming models | Ch 4 (135-140, 155-159) | TV advertising,  Aggregate planning | HW2  9 pm |
| 10 | 6  Tu | Linear programming models (cont’d) | Ch 4 (166-177) | Blending oil,  Production process |  |
|  | 8  Th | **Midterm Exam 1** | Sessions 1-7 (HW1 –HW2) |  |  |
| 11 | 13  Tu | Decision analysis | Ch 9 (457-474) | New product decisions: Single stage,  Using PrecisionTree |  |
| 12 | 15  Th | Decision analysis (cont’d) | Ch 9 (475-478) | Multi-stage: Technology uncertainty | HW3  9 pm |
| 13 | 20  Tu | Intro. to simulation modelling | Ch 10 (516-533) | Pseudo random numbers,  Probability distributions,  Using @Risk |  |
| 14 | 22  Th | Intro. to simulation modelling (cont’d) | Ch 10 (540-544, 551-562) | Ordering calendars: Excel only, Using @Risk, Using RiskSimtable |  |
| 15 | 27  Tu | Simulation models | Ch 11 (589-600) | Contract bidding,  Warranty costs |  |
| 16 | 29  Th | Network models | Ch 5 (219-232) | Transportation model, Production & transportation | HW49 pm |
| 17 | **Nov** 3 Tu | Network models (cont’d) | Ch 5 (233-245) | Bus routes assignment, Transhipment |  |
|  | 5  Th | **Midterm Exam 2** | Sessions 8-15 (HW3 –HW4) |  |  |
|  |  | **Midterm Break** |  |  |  |
| 18 | 17  Tu | Integer programming models | Ch 6 (277-297) | Branch and Bound method,  Capital budgeting,  Fixed cost manufacturing |  |
| 19 | 19  Th | Integer programming models (cont’d) | Ch 6 (303-312) | Locating airline hubs,  Locating & assigning service centres | HW5  9 pm |
| 20 | 24  Tu | Nonlinear programming models | Ch 7 (339-351) | Nonlinear program (Generalized reduced gradient method),  Basic pricing |  |
| 21 | 26  Th | Nonlinear programming models (cont’d) | Ch 7 (384-390) | Matrix multiplication,  Portfolio selection |  |
| 22 | **Dec**  1 Tu | Evolutionary Solver | Ch 8 (407-417, 429-434) | Genetic algorithm, Master production scheduling |  |
| 23 | 3  Th | Macros and Visual Basic for Applications (VBA) | Ch 3 (121-122), Notes |  | HW6  9 pm |

**Please note:** Two weeks before the end of the Term, the SLEQ (Student Learning Experience Questionnaire) will be available on PAWS. Please provide feedback on the quality of my teaching and effectiveness of this course. This is very important to me. Thank you.