Introduction to Quantitative Analysis
Course Outline

Instructor

Aman Pannu
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Classroom Hours
Course Time: 4:00pm - 5:15pm (Monday and Wednesday)

Office Hours
By Appointment

Course Description

BUS 270 is an introduction to the use of quantitative modeling techniques as an aid to Managerial Decision-Making. Emphasis will be on formulation, solution, and sensitivity analysis of the results. This is an application-oriented course with an introduction to some of management sciences techniques that help in taking decisions at the managerial level. Topics of linear programming, allocation of resources and inventory models will be discussed through this course. The course will introduce you to several common mathematical modeling approaches used in practice and will help you develop an understanding of the quantitative solving methods.

Course Outcomes

Upon completion of this course, students should be able to:

- Develop linear programming models and provide their graphical and computer solutions to support decision-making process
- Use of the linear programming techniques at different applications: marketing, financing and operations management
- Understand and model the transportation network flow problems and find the optimum shortest route
- Understand and develop the integer linear programming model and be able to find the optimal integer solution
- Understand and analyze the inventory models with deterministic or probabilistic demand to design a cost-optimized inventory system
- Use decision analysis strategy to find optimal decision alternatives when facing uncertain future events
- Determine sample spaces and find the probability of simple and compound events.
- Draw standard normal distribution curves and determine areas under the curve for a variety of measures

Textbook

Introduction to Management Science
Quantitative Approaches to Decision Making,

The textbook consists of selections from: An Introduction to Management Science Quantitative Approaches to Decision Making 13th Edition. by David R. Anderson, Dennis J. Sweeney, Thomas A. Williams, Jeffrey D. Camm, R. Kipp Martin. Please bring the text book with you for every class. **Text book is required reading material for the class.**
<table>
<thead>
<tr>
<th>Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type</strong></td>
</tr>
<tr>
<td>Attendance/Participation &amp; Pop Quizzes</td>
</tr>
<tr>
<td>Mid-Term 1</td>
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<tr>
<td>Mid-Term 1</td>
</tr>
<tr>
<td>Final Exam</td>
</tr>
</tbody>
</table>

**Classroom Rules**

- 100% class attendance is expected unless student have a recognized emergency
- Please be punctual and arrive class at time and don’t leave before the class ends
- Bring textbook, pens, pencils, graph sheets, basic scientific calculator and ruler with you for every class as you are required to finish practice problems by the end of the class
- The electronic devices including laptops and cell phones are source of distraction and the usage of them is prohibited during the class time. If you are expecting a phone call, please notify me ahead of time and you could step out of the classroom to take the call
- **No text messages, listening to music** and other such activities that distract the instructor and other students around are allowed

**Exam Rules**

- All mid-term exams will be held inside room ED 619
- Midterm exam will start at 4:00 pm so please arrive 5 minutes ahead
- The midterm will cover the material taught up to date. The final exam will cover everything discussed during the term
- An excused absence for a midterm exam may be granted to students based on illness, accident, or other extreme circumstances beyond their control. Supporting documentation is required and must be submitted before an excused absence is approved. You must submit the supporting documentation to the instructor in maximum one week from the day of the examination (no exceptions under any circumstances). If a doctor’s note is presented the note must specify that the student was unable to take the test on the scheduled date due to illness. An appointment card is not considered valid documentation. If a student is granted an excused absence for a midterm the weight of that examination will be added to the weight of the Final Exam
- Extensions on writing the final exam may be granted to students based on illness, accident, or other extreme and legitimate circumstances beyond their control. The authority to approve deferrals of final examinations rests with the Associate Dean Undergraduate in the student’s Faculty. Supporting documentation is required and must be submitted before a deferral is approved.
To be granted a deferred Final Exam a student must be in good standing (passing marks) in the class.

- Midterm and final exams are closed book exams and only simple scientific calculator is allowed.
- You will NOT be allowed to use any other electronic devices (notebooks, electronic translators, cell phones, programmable calculators, financial calculators, palm-pilots, info-red devices, etc.) as a calculator on any exams or other in-class work. If you have doubts if your calculator complies with this rule, please check with me.
- **Bring your student ID with you to all exams and put it on your desk**

### Attendance & Participation

- There will be 10% of the course evaluation assigned for attendance and answering questions during the class. Excused absence will not be counted.

### Other comments

- It is important that you understand the course materials as they are presented; as the semester progresses, concepts tend to build upon earlier materials. Don’t feel afraid to ask questions. If you miss a class session, you are responsible for the material covered during that missed session. Students who attend every class tend to understand the material better and score higher on the exams, so try not to miss class unless you really have to!
- **Academic and Non-Academic Misconduct**
  a. Students enrolled in BUS courses at the U of R are expected to adhere rigorously to principles of intellectual integrity. Plagiarism or cheating on examinations is a serious offence and could result in a zero grade on that test, a failing grade in the course and/or expulsion from the university.
  b. For information about Academic and Non-Academic Misconduct please consult the Regulations Governing Discipline for Academic and Non-Academic Misconduct at the University of Regina 2019-2020 Undergraduate Calendar.
- All grades will be posted on UR Courses.
- Class attendance: Regular class attendance is encouraged since it helps students understand the material.
- UR Courses: In this class we will use UR Courses extensively. Chapter Slides, Class Problems, Reviews, grades, important messages, discussion boards, etc. will be posted on UR Courses. Make sure you check UR Courses for BUS 270 before every class.

### Students with Disabilities

- Any student requesting disability accommodation for this class must inform the instructor giving appropriate notice. You also need to contact the Coordinator of Special Needs Services at (306) 585-4631 to certify documentation of disability and to ensure appropriate accommodations are implemented in a timely manner.
## Changes

- The instructor reserves the right to amend, adjust, or otherwise modify the outline and syllabus at any time during the course. If I do, I will notify the class.
- I will assume that every student who remains enrolled in the course after the syllabus has been distributed has fully understood the grading system, the examination dates and the class policy.

## Tentative Course Outline

<table>
<thead>
<tr>
<th>Textbook Chapter</th>
<th>Topics to be Covered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chapter 1</td>
<td>Introduction: Quantitative Analysis and Decision Making, Models of Cost, Revenue and Profit</td>
</tr>
<tr>
<td>Chapter 2</td>
<td>An Introduction to Linear Programming (LP): A Maximization Problem, Graphical Solution Procedure, Feasible Region, Extreme Points and the Optimal Solution, A Minimization Problem, Special Cases, Computer Solution, LP Notation</td>
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<tr>
<td>Chapter 3</td>
<td>Linear programming: Sensitivity Analysis and Interpretation: Graphical Solution, Range of Optimality, Reduced Cost, Dual Price, Slack and Surplus Variable, Standard Form, LP Format, Range of Feasibility, 100 % rule, Computer Solution</td>
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<td>Chapter 4</td>
<td>LP Applications: Marketing Applications, Financial Applications, Operations Management Applications</td>
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<td>Chapter 6</td>
<td>Distribution and Network Models: Transportation, Assignment, Transhipment, Shortest Route, Maximal Flow, Production and Inventory Applications</td>
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<td>Chapter 7</td>
<td>Integer Linear Programming: Types, Graphical and Computer Solution for an all integer LP, Applications with 0-1 variables.</td>
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<tr>
<td>Chapter 10</td>
<td>Inventory Models: EOQ, EPLS, Planned Shortages, Quantity Discounts, Probabilistic Demand Models</td>
</tr>
<tr>
<td>Chapter 13</td>
<td>Decision Analysis: Formulation, Decision Making with/without Probabilities, Risk Analysis, Decision Analysis with Sample Information, Computing Branch Probabilities, Bayes’ Theorem</td>
</tr>
</tbody>
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