MGT 40150 – Quantitative Decision Modeling

Fall 2017

# Basic Information

## Course

* Website: All course materials can be found on <http://sakai.nd.edu/>.
* Where: Mendoza College of Business L068
* When: Monday, Wednesday 11:00am – 12:15pm (Section 1)

Monday, Wednesday 11:00am – 12:15pm (Section 2)

## Instructor

* Name: Seth Berry
* Email: [sberry5@nd.edu](mailto:sberry5@nd.edu)
* Office Phone: (574) 631-9089
* Office Location: 321 Mendoza College of Business
* Office Hours: Tuesday 2:00pm – 4:00pm or by appointment

# Course Objectives

By the end of the course, students will be able to:

* Identify business problems that can be solved using advanced quantitative techniques.
  + Our problems come from information systems, operations, accounting, finance, and marketing. Examples include process improvement, portfolio selection, financial planning, logistics systems, revenue management, etc.
  + The techniques we study are simulation and optimization.
* Model and solve these problems with spreadsheets. (We use Excel spreadsheets and Excel add-ins such as SimQuick, Solver, and @Risk). The more you understand the details of these models, the better you will be able to find applications at your workplace.
* Improve your spreadsheet skills. Only a basic familiarity with spreadsheets is assumed at the outset.
* Improve your quantitative problem solving skills.

# Required Materials

## Textbooks

* (Required) SimQuick: Process Simulation with Excel, 3rd edition by Hartvigsen. This textbook can be ordered from Amazon (<http://www.amazon.com/SimQuick-Process-Simulation-Excel-3rd/dp/1518857965/>). (The SimQuick spreadsheet can be downloaded for free from [SimQuick.net](file:///C:\Users\sberry5\Documents\class\SimQuick.net).)
* (Optional) Practical Management Science (PMS), 5th edition by Winston and Albright. (There is a cheaper e-book version available at <http://www.cengagebrain.com>).

## Software

* We will use Microsoft Excel to implement many of the concepts and methods we discuss in class. Access to Microsoft Excel is required.
* Excel add-ins: Solver and @Risk.
* Excel spreadsheets: SimQuick and other spreadsheets that are provided in class.

# Course Activities

This course includes a variety of activities described below.

* *Class Participation*: Students will be asked to work on some practice questions (either individually or in small groups) in class. Students are expected to attend *all* lectures as well as actively participate in *all* in-class activities. Students will be responsible for knowing everything that happens in class as well as any announcements posted on Sakai. Class participation will be graded based on the rubric presented below.

*Rubric for Class Participation*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | A (Exemplary) | B (Competent) | C (Developing) | D |
| Frequency and Quality | Attends class regularly and *always contributes* to the discussion by raising thoughtful questions, analyzing relevant issues, building on others’ ideas, synthesizing across readings and discussions, expanding the class’ perspective, and appropriately challenging assumptions and perspectives. | Attends class regularly and *sometimes contributes* to the discussion in the aforementioned ways. | Attends class regularly but *rarely contributes* to the discussion in the aforementioned ways. | Attends class regularly but *never contributes* to the discussion in the aforementioned ways. |

Source: Eberly Center for Teaching Excellence, Carnegie Mellon University

* *Readings*: Students are assigned to read the corresponding book chapters. Although these readings will not be graded, they are helpful for a better understanding of the materials.
* *End-of-Class Exercises*: Right after each class is introduced, students will work *individually* in class to solve one or two questions related to the new topic. Although these exercises will not be graded, they are designed for students to receive immediate feedback from the instructor regarding the recently learned topic.
* *Assignments*: There will be four assignments which will be graded. These assignments and due dates will be announced during the class. Assignments can be done *individually or in groups of two or three*. Please hand in one *hard-copy* solution set per group. It is advised to start the assignments early and bring questions to the office hours. Late assignments within 48 hours of the due date will be accepted with a penalty of up to 20% of the total grade. Solutions to the assignments will be posted on Sakai 48 hours after the due date. No assignments will be accepted after solutions are posted. If a student has to miss an assignment due to an approved university absence, it is the student's responsibility to notify the instructor in advance so that a make-up assignment can be arranged.
* *Exams*: There will be a midterm exam and a final exam. The final exam will be *cumulative*. Any exam missed without a university approved excuse will be assigned a grade of zero. If a student has to miss an exam due to an approved university absence or exam scheduling conflicts, it is the student's responsibility to notify the instructor in advance so that a make-up exam can be arranged.
* *Exercises for Exams*: Right before the two exams, students will work together in *groups of two or three* in class to solve questions related to the topics covered in the incoming exam. These exercises are designed for students to learn from each other and be better prepared for the exams. The answers achieved through group discussions will *not* be counted towards students’ course grades.

# Grading

The grading weights are as follows:

|  |  |
| --- | --- |
| Four Assignments | 60 points ( 20%) |
| Midterm Exam | 100 points (33.33%) |
| Final Exam | 125 points (41.67%) |
| Class Participation | 15 points ( 5%) |
| Total: | 300 points ( 100%) |

Grades will be awarded according to the following criteria.

|  |  |
| --- | --- |
| 279 points (93%) or more | A |
| 270 points (90%) or more but less than 279 points (93%) | A– |
| 261 points (87%) or more but less than 270 points (90%) | B+ |
| 249 points (83%) or more but less than 261 points (87%) | B |
| 240 points (80%) or more but less than 249 points (83%) | B– |
| 231 points (77%) or more but less than 240 points (80%) | C+ |
| 219 points (73%) or more but less than 231 points (77%) | C |
| 210 points (70%) or more but less than 219 points (73%) | C– |
| 180 points (60%) or more but less than 210 points (70%) | D |
| Less than 180 points (60%) | F |

A grading curve may be used to increase the median grade in the class.

# Academic Honesty

Students in MGT 40150 are expected to abide by the University of Notre Dame Academic Code of Honor (<http://honorcode.nd.edu/>) for all matters relating to MGT 40150. Recall the Code of Honor Pledge – “As a member of the Notre Dame community, I will not participate in or tolerate academic dishonesty.”

# Tentative Schedule

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| *Week* | *Date* | *Topics and In-Class Activities* | *Readings* | *Assignments* |
| *1* | *10/23 (M)* | * Course Introduction |  |  |
| *10/25 (W)* | * Process Simulation (SimQuick) 1 |  |  |
| *2* | *10/30 (M)* | * Process Simulation (SimQuick) 2 | SimQuick Chap 1&2 | Assignment 1 Assigned |
| *11/01 (W)* | * Process Simulation (SimQuick) 3 | SimQuick Chap 3&4 |  |
| *3* | *11/06 (M)* | * Process Simulation Review |  | Assignment 1 Due  Assignment 2 Assigned |
| *11/08 (W)* | * Linear Programming 1 & 2 | PMS Chap 4 |  |
| *4* | *11/13 (M)* | * Exercises for the Midterm Exam * Midterm Review |  | Assignment 2 Due |
| *11/15 (W)* | * Midterm (usual class time and location) |  |  |
| *5* | *11/20 (M)* | * Network Models, Integer and Nonlinear Programming 1 | PMS Chap 5-7 | Assignment 3 Assigned |
| *11/22 (W)* | * No Class for Thanksgiving |  |  |
| *6* | *11/27 (M)* | * Network Models, Integer and Nonlinear Programming 2 | PMS Chap 5-7 |  |
| *11/29 (W)* | * Spreadsheet Simulation (@Risk) 1 | PMS Chap 10&11 | Assignment 3 Due  Assignment 4 Assigned |
| *7* | *12/04 (M)* | * Exercises for the Final Exam |  | Assignment 4 Due |
| *12/06 (W)* | * Final Review |  |  |
| *8* | *12/12 (T)* | * Final 4:15-6:15 L068 |  |  |

The course schedule is subject to change at the instructor’s discretion. The most updated schedule can be found on Sakai.

\* The syllabus was graciously provided by Professor Hong Guo and adapted accordingly.