COLORADOSCHOOLOFMINES

EBGN 525 - Business Analytics
Division of Economics and Business
Fall 2016
Tu/Th 12:30 pm – 1:45 pm – MZ 335

Instructor

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Office hours: Tuesday/Thursday 3:00 pm – 4:30 pm, or by appointment.

Course Details

Instructional activity: 3 hour lecture

Course designation: ETM Core

Course description:

With the increasing availability of large volumes of raw business data, the process of converting it into meaningful insights has become critical for organizations to stay competitive. Driven by massive volumes of business data, business analytics has become instrumental in unveiling such managerial practices which guide the decision making process in companies at every operational stage. This course includes various descriptive, predictive and prescriptive business analytics strategies. It provides fundamental skills using quantitative tools to organize, process, and critically interpret business data, as well as key concepts in quantitative decision making to model and solve real-world problems.

At the end of the semester, students will learn:

1) How managers handle their data.
2) Different strategies and the use of technology in analyzing the data.
3) Quantitative decision making tools used to model and solve real-world problems.
4) Critical thinking skills used to interpret and learn from data, and derive meaningful insights.

Course Materials

Blackboard : This course will make use of Blackboard. All course materials will be available on the course site (listed as EBGN525 Business Analytics).

Textbook: Cliff T. Ragsdale, Spreadsheet Modeling and Decision Analysis: A Practical Introduction to Business Analytics, 7th edition, ISBN: 978-1285418681.

Software: This course will make use of Microsoft Excel. It is required that all students have Excel installed on their computers.

This course will also utilize the "Analytic Solver Platform" add-in on Excel. Please carefully follow the instructions below to download it on your computer. Please make sure to install Excel before downloading the add-in.

Preparation:

1. If you have a Mac, visit and read www.solver.com/using-frontline-solvers-macintosh. To use the software for this course, you will need to install Windows alongside Mac OSX, and install Excel or Office for Windows. This will also allow you to use other Windows software, as well as Mac software on your machine. (You can request a license for VMware Fusion on CCIT website: http://ccit.mines.edu/CCIT-VMAP)

2. Check whether you have 32-bit or 64-bit Excel – this determines which software version you should download. You probably have 32-bit Excel. You have 64-bit ONLY if (i) in Excel 2010, you click File – Help, and you see 64-bit in the lower right, or (ii) in Excel 2013, you click File – Account – About Excel, and you see 64-bit at the top of the dialog.

Registration:

1. Point your browser to http://www.solver.com/welcome-students. (Do not attempt to register or download anywhere else on Solver.com – this will cause trouble later.)

2. Fill out the form on this page. Enter your email address (to ensure you receive your license activation code), enter a login password you can remember, enter your first and last name, and name for your school.

3. Enter **RSMDA** for the Textbook Code and **EBGN525F16** for the Course Code. These are special for our course – entering these will give you a 140-day license. (Leaving them blank will give you a 15-day license.)

4. Check the box to acknowledge that you accept the Frontline Systems license agreement. Note: Frontline receives no money from you, or the textbook publisher, or the university; this free 140-day license is a courtesy that they offer to students.

5. Click the button Proceed to Download Page. If everything is OK, this will take you to the Download page.

Download:

1. On the Download page, change 32-bit to 64-bit ONLY if you have confirmed that you have 64-bit Excel (see above). Click the blue Download Now button.

2. In some browsers you will see a dialog "Do you want to run or save this file?" Click Save to save the file, named either SolverSetup.exe or SolverSetup64.exe.

3. Now check your email, at the email address you entered above, for a message containing an installation password and a license activation code. Frontline sends this email twice, from different servers, to ensure that you receive it. If you don't get it, visit www.solver.com/installation-password-request and login to request another email message.

Installation:

1. Make sure that Excel is closed (not running), then run the program SolverSetup.exe (or SolverSetup64.exe). SolverSetup will prompt you to enter the password and activation code from the email message above – enter them exactly as shown in the email (you can copy and paste).

2. The SolverSetup program will prompt you to choose between Analytic Solver Platform, Risk Solver Platform and XLMiner. Choosing Analytic Solver Platform gives you all the features of Risk Solver Platform and XLMiner, so this is usually the best choice. You can CHANGE this choice later in Excel, by choosing a menu option Help – Change Product on the Ribbon.

3. When the SolverSetup program finishes, start Excel (the last Setup dialog prompts you to do this). You should see new tabs on the Ribbon for Analytic Solver Platform or Risk Solver Platform, and XLMiner. Click the Solver Platform tab – you should see a "Welcome" dialog with various links. Use the Help dropdown menu to open Help text, the User Guide and Reference Guide, and load example workbooks.

If all has gone well, you are ready for our class exercises. If you have problems, the best avenues to get help are to email support@solver.com (this creates a support ticket in Frontline's Help Desk) or start a Live Chat from any page on www.solver.com, or from within Excel (Help – Support Live Chat).

Policy on academic integrity/misconduct: The Colorado School of Mines affirms the principle that all individuals associated with the Mines academic community have a responsibility for establishing, maintaining an fostering an understanding and appreciation for academic integrity. In broad terms, this implies protecting the environment of mutual trust within which scholarly exchange occurs, supporting the ability of the faculty to fairly and effectively evaluate every student's academic achievements, and giving credence to the university's educational mission, its scholarly objectives and the substance of the degrees it awards. The protection of academic integrity requires there to be clear and consistent standards, as well as confrontation and sanctions when individuals violate those standards. The Colorado School of Mines desires an environment free of any and all forms of academic misconduct and expects students to act with integrity at all times.

Academic misconduct is the intentional act of fraud, in which an individual seeks to claim credit for the work and efforts of another without authorization, or uses unauthorized materials or fabricated information in any academic exercise. Student Academic Misconduct arises when a student violates the principle of academic integrity. Such behavior erodes mutual trust, distorts the fair evaluation of academic achievements, violates the ethical code of behavior upon which education and scholarship rest, and undermines the credibility of the university. Because of the serious institutional and individual ramifications, student misconduct arising from violations of academic integrity is not tolerated at Mines. If a student is found to have engaged in such misconduct sanctions such as change of a grade, loss of institutional privileges, or academic suspension or dismissal may be imposed.

The complete policy is available at: http://bulletin.mines.edu/policiesandprocedures/

Disability Support: The Colorado School of Mines is committed to ensuring the full participation of all students in its programs, including students with disabilities. If you are registered with Disability Support Services (DSS) and I have received your letter of accommodations, please contact me at your earliest convenience so we can discuss your needs in this course. For questions or other inquiries regarding disabilities, I encourage you to visit disabilities.mines.edu for more information.

Coursework Return Policy: All homework assignments, exams and the project will be graded and returned within two weeks of their submission date.

Absence Policy: Class attendance is required. Students who miss class should email the instructor for the reason of the absence at least one day prior to the absence.

Course Assignments & Grading

Homework:
There will be a homework assignment every week. Please check the detailed course schedule below for the details. Homework must be turned in before it is due to be graded. Late submissions will not be accepted for grading. Please clearly explain each question and make sure to work on your own.

Exams: There will be two exams (one midterm and one final). Both will be closed book, closed notes. You can bring a one sided 8.5x11 sheet with your notes and formulas. Please make sure to prepare it by hand. Computer printouts will not be accepted. If you are to be absent during a scheduled exam, you should schedule time for a make-up before you leave.

Class Project: In this class, you will be required to complete a term project. You will work in groups of 3 students. Please form your groups and submit it at the beginning of the second week along with the project topic you will be working on.

- Define managerial question(s) which are (preferably) related to your major.
- Clearly provide a motivation about your real-world scenario.
- Based on your need, collect data. You can search for statistical databases online (such as U.S Data and Statistics).
- Implement at least one data analytics and at least one decision analysis technique in order to answer your managerial questions.
- The outcome of one analysis can be an input to another!
- Discuss your techniques/models and the reason you chose those.
- Report and discuss your results.
- Discuss the managerial insights you drove from your models/solutions. Discuss what you have learned and answer your managerial questions.
- The report must be written in a standard scientific paper format.
- Each group must give a 15-minute presentation at the end of the semester.

Grading Procedures: The final grade is based on homework assignments, two exams and the class project. Final grade percentage breakdown is as follows:

Homework Assignments: 25%
Exams: 40%
Class Project: 30%
Class Participation: 5%

To pass the course, the overall grade percentage must be at least 60%. The letter grade assignment from your final grade will be based on the following scale:

A $93 \leq$ Final grade
A- $90 \leq$ Final grade < 93
B+ $87 \leq$ Final grade < 90
B $83 \leq$ Final grade < 87
B- $80 \leq$ Final grade < 83
C+ $77 \leq$ Final grade < 80
C $73 \leq$ Final grade < 77
C- $70 \leq$ Final grade < 73
D+ $67 \leq$ Final grade < 70
D $60 \leq$ Final grade < 67
F   Final grade < 60

Detailed Course Schedule Fall 2016 (*subject to minor revision*):

Week	Day	Date	Chapter	Topic	HW/Project	Due Date
1	Tue	8/23/2016	Ch1	Introduction to Modeling and Decision Analysis		
	Thu	8/25/2016	Ch9	Regression Analysis	Homework 1	9/1/2016
2	Tue	8/30/2016	Ch9	Regression Analysis	**Project Group Submission Due: 8/30/2016**	
	Thu	9/1/2016	Ch9	Regression Analysis	Homework 2	9/8/2016
3	Tue	9/6/2016	Ch10	Data Mining		
	Thu	9/8/2016	Ch10	Data Mining	Homework 3	9/15/2016
4	Tue	9/13/2016	Ch11	Time Series Forecasting		
	Thu	9/15/2016	Ch11	Time Series Forecasting	Homework 4	9/22/2016
5	Tue	9/20/2016	Ch12	Introduction to Simulation using Analytic Solver Platform		
	Thu	9/22/2016	Ch12	Introduction to Simulation using Analytic Solver Platform	Homework 5	9/29/2016
6	Tue	9/27/2016	Ch13	Queuing Theory		
	Thu	9/29/2016	Ch13	Queuing Theory	Homework 6	10/6/2016
7	Tue	10/4/2016	Ch14	Decision Analysis		
	Thu	10/6/2016	Ch14	Decision Analysis	Homework 7	10/13/2016
8	**Tue**	**10/11/2016**		**Midterm**		
	Thu	10/13/2016	Ch2	Introduction to Optimization and LP	Homework 8	10/20/2016
9	**Tue**	**10/18/2016**		**Fall Break**		
	Thu	10/20/2016	Ch3	Modeling and Solving LP Problems in a Spreadsheet	Homework 9	10/27/2016
10	Tue	10/25/2016	Ch3	Modeling and Solving LP Problems in a Spreadsheet		
	Thu	10/27/2016	Ch3	Modeling and Solving LP Problems in a Spreadsheet	Homework 10	11/3/2016
11	Tue	11/1/2016	Ch4	Sensitivity Analysis and the Simplex Method		
	Thu	11/3/2016	Ch4	Sensitivity Analysis and the Simplex Method	Homework 11	11/10/2016
12	Tue	11/8/2016	Ch5	Network Modeling		
	Thu	11/10/2016	Ch5	Network Modeling	Homework 12	11/17/2016
13	Tue	11/15/2016	Ch6	Integer LP		
	Thu	11/17/2016	Ch6	Integer LP	Homework 13	11/22/2016
14	Tue	11/22/2016	Ch7	Nonlinear Programming and Evolutionary Optimization		
	Thu	**11/24/2016**		**Thanksgiving Holiday**		
15	Tue	11/29/2016	Ch7	Nonlinear Programming and Evolutionary Optimization	Homework 14 Due: 12/6/2016 **Project Report Due: 11/29/2016**	
	Thu	12/1/2016		Class Project Presentations		
16	Tue	12/6/2016		Class Project Presentations		
	Thu	12/8/2016		Class Project Presentations	**Project Report Due: 12/8/2016**	
	TBA	**TBA**		**Final**		