Introduction to Business Analytics: The Art, Science & Technology of Decision Modeling & Analysis

SCMS 7110
Fall 2017
3.0 Credit Hours

Instructor: Dr. Mehdi Amini, Ph.D.
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Office: FCBE 229
Office Hours: T 11:00 AM–1:00 PM & R 2:00–3:00 PM

COURSE DESCRIPTION:

Sustainable competitive advantage requires model- and data-driven decision making at the strategic, tactical and operations levels, referred to as Business Analytics (BA). Business Analytics is a set of knowledge, practices, models, tools and technologies utilized in the real world by all industries for effective managerial decision-making. The major objective of this course is to provide students with a broad theoretical as well as practical knowledge about business analytics, including a host of decision modeling tools and technologies to support and improve managerial decision making in a variety of industries.

The course provides basic knowledge and skills for model- and data-driven decision-making based on hands-on experience with relevant tools and technologies adopted from the areas of descriptive analytics, predictive analytics and prescriptive analytics. The course introduces and examines the critical role of business analytics in approaching a host of strategic, tactical and operational issues and problems. Applying case study- and real-world project-based approaches, we focus on problem framing, model building, and decision-making approaches and technologies. Extensive use is made of Analytics Solver Platform for Education (ASPE) software system. ASPE is an Excel-based and free-to-use for the duration of the semester.
■ COURSE OBJECTIVES:

- Developing a knowledge base required for business analytics.
- Enhancing understanding of tools and skills sets required for application of business analytics approaches to real-world managerial decision making.
- Providing opportunities for applying various business analytics technologies to managerial decision-making.
- Improving the critical-thinking process.

■ TEXTBOOK & LECTURE NOTES:

3. Business Analytics: Copyrighted Lectures PP Slides, Dr. Amini@2017.

■ ADDITIONAL READINGS/VIDEOS:

To further support our discussions, you will be asked to review some articles and be prepared to discuss them during the class sessions. Please check the course website for the readings assignments. In addition, occasionally you will be assigned some relevant videos to our class discussions.

■ COPYRIGHTED LECTURE POWERPOINT SLIDES & NOTES:

My lectures’ PP slides will be available on the course website for your download. You might make a single copy of the slides for your use, but please note that the material within the lecture notes are copyrighted and are prohibited for copying and distribution. The material within the lecture PP slides are copyrighted due to my publisher’s request.

■ COURSE WEBSITE:

The website for this course may be found at: eCourseware. The website is organized to include all relevant documents to the course.

■ OTHER RELATED WEBSITES:

• Analytics Magazine:  
  http://www.analytics-magazine.org/ 
• OR/MS Today: The most current articles  
  http://www.oms-today.org/ormsmain.shtml

**SOME RELEVANT JOURNALS:**

• Interfaces 
• MS/OR Today Management Science  
  Operations Research 
• International Journal of Supply Chain Management 
• Operations Management 
• Operations and Production Management

**HARDWARE, SOFTWARE AND INTERNET REQUIREMENTS:**

• You need to have access to a desktop or laptop. Having a laptop and bringing it to each class session would allow students to effectively benefit from hands-on class exercises. I encourage you all to bring your laptops to each class session.

• Your desktop/laptop should have MS Office 2010, including PowerPoint, Word and Excel.

• You need to be fresh on your MS Excel skillsets. To refresh yourself, please study *Appendix B* in your textbook.

• You will be installing an Excel-based free software, **Analytics Solver Platform for Education (ASPE)**. We will using ASPE throughout my lectures and for all your group assignments, including class exercises, group homework and case study assignments. Within the Getting Started folder, you may find *Analytics Solver Platform for Education_Student Installation Guidelines*. This document includes a step-by-step process to install the software system.

• You need to have access to internet. This allows you to access the course website and participate in your Student-Group Discussion Board for completing assignments, cases, project and studying for exams.

• You need to have MS Media Player or other players allowing you to access YouTube videos.

**INDIVIDUAL STUDENT AND STUDENT GROUP ACTIVITIES:**

• **Readings and Videos Assignments:** To be prepared for our class discussions there are three sets of readings assignments are assigned to individual student. These assignments should be completed prior to the designated class session. They
include: (a) Chapters from the textbook prior to class sessions; (b) Relevant papers supporting our discussions; and (c) YouTube videos discussing different topics, modeling approach, real-world applications and Excel modeling functions and tools.

- **Business Analytics Summary Stories**: On a weekly basis, each group is responsible to: (a) identify a relevant business analytics story. The source could be published articles in magazines and newspapers or videos; (b) summarize the story; (c) present it in the class; (d) submit a copy of the summary story along with a copy of the reference (or URL). These summary stories will be posted on the course website for access of other student groups.

- **Student-Group Case Studies**: Giving students the opportunity to practice the learned business analytics knowledge, methods and tools, from each chapter/lecture, a set of case studies would be assigned to different student groups for analysis and presentation in the class. Each student group is required to submit a single case analysis report and PowerPoint presentation for each assigned case.

Above, I have listed an optional book, *The Case Study Handbook: How to Read, Discuss, and Write Persuasively about Cases*. This book would be very useful in analyzing and reporting the outcomes of case studies. Knowing that MBA-level courses all involve case studies, I believe the book would be a good investment for not only this course but also the courses you plan to take within the MBA program. This also would be useful for your group semester project.

- **Student-Group Case Study Assignments**: Please note that each case study might be assigned to one or two student groups. Each assigned case study will be presented and discussed in the class by the individual or competing groups. This may give us more than one analyses on each case, enriching our class discussions. The list of the case study titles and sources would be posted on the course website.

- **Student-Group Real-World Semester Project**: Each student group: (a) selects one a real-world project from one of the group members’ affiliated organization, (b) develops and submits a project proposal by the indicated deadline; (c) applies business analytics, the learned knowledge, methods and techniques toward solution recommendation; (d) during the final exams dates, each student group presents the project outcomes, including organization overview, the specific managerial issue, data collection, modeling efforts, solution and analysis of results, and final recommendations; and (e) submits a project report along with relevant Excel workbooks should be submitted. Groups may follow the format of the assigned case studies to develop the project report followed by the analysis and recommendation. Guidelines provided in the *Case Study Handbook* would be very useful in developing your presentation and final report.

- **Pop-Quizzes**: Occasionally, you’ll have pop-quizzes covering my previous lecture and contents of the assigned chapters. Be sure that you keep up with your readings.
assignments and lectures.

- **Exams:** To be sure that the fundamental knowledge, methods and tools covered in this course are learned, two exams will be administered. All students will be taking the exams on the scheduled dates. The exams might be offered in the class or be given online. **There is no make-up exam.**

- **STUDENT ATTENDANCE AND PARTICIPATION POLICIES:**

  Class attendance and participation are expected. An attendance sheet is distributed for every class session to be signed by individual students. Active participation of students in all class discussions, homework assignments, case study discussions, and semester projects discussions are encouraged by the course grading method. Topics may be presented that are not within the textbook. A substantial portion of this class is intended to foster learning through discussion.

- **COURSE ACTIVITIES EVALUATION:**

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<thead>
<tr>
<th>Main Activity</th>
<th>Sub Activity</th>
<th>Main Activity Percentage Contribution</th>
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<tbody>
<tr>
<td>Group Business Analytics Summary Stories</td>
<td>Discussion and Summary Reports</td>
<td>10%</td>
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<tr>
<td>Group Homework Assignments</td>
<td>Solutions and Excel workbooks</td>
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</tr>
<tr>
<td>Group Case Assignments</td>
<td>Presentations &amp; Reports</td>
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<td>Exams I &amp; II and Pop-Quizzes</td>
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<td>Class Participations</td>
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- **FINAL GRADE ASSIGNMENT:**

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<td>90-94.99% =</td>
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REQUIRED MICROSOFT EXCEL SKILLS:

Using the Analytics Solver Platform for Education (ASPE) software effectively, you all need to have basic Excel skills. To be refreshed about Excel, I recommend you all to review Chapters 2 through 7 & 11 in the textbook.

REQUIRED ANALYTICS SOLVER PLATFORM FOR EDUCATION (ASPE) SOFTWARE SYSTEM:

Lectures, in-class exercises and group assignments require the use of ASPE. ASPE is an excel-based software platform. It is free for installation and use during the semester. You may find a document, within the Getting Started folder on the course website, describing an step-by-step process to download the software. After you complete the ASPE installation, you may access the ASPE User Guides for different platforms, including discussions of examples, are available via the Help tab. In addition, examples for different business analytics methods are also included via the ASPE Help tab.

CLASSROOM CONDUCTS:

1. Please arrive on time.
2. Be prepared.
3. Submit your assignments on time.
4. Turn-off your cells during the class sessions.
5. No Internet browsing unless it is permitted for a class exercise.

MBA DEGREE PROGRAM LEARNING OUTCOMES:

The learning outcomes for this degree program are located on the following URL. Notice that Goals indicate Learning Outcomes for the degree program. The objectives under each learning outcome indicate what must be done to reach the learning outcome. Faculty members in the Fogelman College developed these learning outcomes and periodically assess students to determine the level that the learning outcomes are being met. URL:
http://www.fcbeassessment.net/LearningOutcomes/MBADegreeLearningOutcomes.pdf

ACADEMIC INTEGRITY, CLASS CONDUCT AND PRE-REQUISITES:

Students are expected to familiarize themselves with the guidelines outlined on the website of the Office of Student Judicial and Ethical Affairs (http://saweb.memphis.edu/judicialaffairs) and to behave accordingly. Any violations of academic integrity will be reported to the University’s authorities. The University has strict codes concerning cheating (see the Academic Misconduct section of the Student Handbook). Compliance with University code is required and will be strictly
enforced.

- **STUDENT SERVICES:**
  
  Please access the **FCBE Student Services** page for information about:
  
  - Students with Disabilities
  - Tutoring and other Academic Assistance
  - Advising Services for Fogelman Students
  - Technical Assistance

- **COURSE SCHEDULE:**

  The schedule presented in this syllabus is a tentative outline for the course. We will make a reasonable effort to adhere to this schedule. However, you should know that I reserve the right to alter this calendar as circumstances may dictate. All changes will be announced in class/the course website. The lecture topic and number, related chapter(s) in the textbook, Student-Group Homework Assignment and Student-Group Case Assignment. Other reading/video assignments and exercises are included within the lecture PP slides posted on the course website.

  **Abbreviations used in the course schedule:**
  
  - CH: Refers to Chapter in the textbooks.
# Intro to Business Analytics
## SCMS 7110 - Fall 2017

<table>
<thead>
<tr>
<th>Session</th>
<th>Date</th>
<th>Topic</th>
<th>Readings</th>
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<tbody>
<tr>
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<td>Pre-Semester</td>
<td>Descriptive Analytics</td>
<td>CHs 2 through 7</td>
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<td>02</td>
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<td>Predictive Analytics: Regression Models &amp; Analysis</td>
<td>CHs 8 &amp; 11</td>
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<td>Predictive Analytics: Forecasting Models</td>
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<td>Predictive Analytics: Introduction to Data Mining</td>
<td>CHs 10 &amp; 11</td>
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<td>05</td>
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<td>Group Real-World Semester Project Proposal &amp; Group Case Study 01 Preparation: Groups Breakout</td>
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<td>Group Case Study 01: Presentations &amp; Discussions</td>
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<td>07</td>
<td>R 10/12</td>
<td>Prescriptive Analytics: Linear Optimization Models</td>
<td>CH 13</td>
<td>Lecture 05</td>
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<td>08</td>
<td>R 10/19</td>
<td>Group Case Study 02: Presentations &amp; Discussions</td>
<td>CHs 14 &amp; 15</td>
<td>Lecture 06</td>
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**BUSINESS ANALYTICS: DESCRIPTIVE ANALYTICS PRE-REQUISITE**

**MODULE I: BUSINESS ANALYTICS**

**MODULE II: PREDICTIVE ANALYTICS**

**MODULE III: STATIC PRESCRIPTIVE ANALYTICS**

Fall Break: Saturday – Tuesday October 14-17
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**Exam I: Lectures 1 through 6, CHs 8 – 11 & 13-15**

**MODULE IV: DYNAMIC PRESCRIPTIVE ANALYTICS**

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<td>10</td>
<td>R 11/02</td>
<td>Prescriptive Analytics: Decision Analysis Models</td>
<td>CH 16</td>
<td>Lecture 07</td>
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**Group Case Study 04: Presentations & Discussions**

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<tr>
<td>12</td>
<td>R 11/16</td>
<td>Prescriptive Analytics: Simulation Models</td>
<td>CH 12</td>
<td>Lecture 08</td>
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**Thanksgiving: Wednesday - Sunday, November 22-26**

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**Exam II: Lectures 7 & 8, CHs 12 & 16**

**LAST DAY OF CLASSES: Wednesday, December 6**

**STUDY DAY: Thursday, December 7**

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<th>Date</th>
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**Group Assignments Binder: Submission**
Dr. Amini is the *George Johnson Professor* of Supply Chain and Operations Management at the Department of Marketing & Supply Chain Management, in the Fogelman College of Business and Economics (FCBE), at The University of Memphis. He holds *Visiting Professorship* in the Division of Industrial Marketing, Business Administration and Industrial Engineering, the Department of Business Administration, Technology and Social Sciences, at the Luleå University of Technology, Sweden. He serves as Associate Director of *FedEx Center for Supply Chain Management* and Founding Director of the *Enterprise Simulation and Optimization Lab (eSOL)*, at The University of Memphis. In addition, he served as Director of FCBE Master Programs from 1994 to 1996.

For over two decades, Dr. Amini primary teaching have been in the areas of supply chain management, operations management, sustainable enterprise and business analytics. He has been teaching in the undergraduate, Professional MBA, Executive MBA, Customer-Driven MBA, and Ph.D. programs in United States and countries in Europe, Africa, and Middle East.


Dr. Amini has received several millions dollars of funding from institutions within the private and public sectors to support different research projects. He has been involved in corporate research, consulting, and executive educational programs for more than two decades. He has received several university awards for excellence in teaching, research, service, and outreach efforts.

Dr. Amini holds a BA in Business Administration from The University of Tehran. He received his MBA degree in Production Operations Management from The University of North Texas, USA, and MS and Ph.D. degrees in Operations Research from Southern Methodist University, USA.