MIS 749 Business Analytics

Spring 2015

San Diego State University
College of Business Administration
Department of Management Information Systems

Instructor: Dr. Bruce A. Reinig
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Time: Sect. 1: W 4:00pm to 6:40pm
   Sect. 2: W 10:00am to 12:40pm

Venue: Sect. 1 is in GMCS-309 and Sect. 2 is in EBA-341

Office Hours: Weds 2pm to 3:30pm or by appointment

Text:
   Required: Shmueli, G., Patel, N., and Bruce, P. Data Mining for Business
             Intelligence: Concepts, Techniques, and Applications in Microsoft Office Excel

   Optional: Anderson, D.R., Sweeney, D.J. and T.A. Williams, Modern Business

Accessing Course Materials:
Course materials, including lecture notes, data files and case assignments will be made available
via the SDSU blackboard website (blackboard.sdsu.edu). Please check the website regularly and
bring printed copies of course materials to class with you to assist in your note taking.

Prerequisites: BA 623 Statistical Analysis.

Catalog Description:
Business analytics techniques for predictive modeling and customer segmentation. Applications
include churn management, business experiments, cluster segmentation, and market basket
analysis.

Overview:
The objective of this course is to learn to use business analytics techniques to support managerial
decision making. Greater emphasis is placed on the application itself, as well as the
interpretation and presentation of results, as opposed to the mathematical derivation, of the
techniques covered. The course is designed to provide hands-on opportunities for students to
work with data and apply advanced statistical techniques. The course will be a mix of lectures,
in-class workshops, and student presentations. Students are encouraged to bring a laptop to class
with Excel 2013 (Windows version) and XLMiner installed. Students will have the opportunity
to use SPSS, SAS, and Minitab to complete case assignments. This class is targeted to MBA
students who aspire to succeed as business analysts and managers and recognize the need for
hands-on analytical skills to improve decision making in the organization.
This course is intended to help achieve the Association to Advance Collegiate Schools of Business (AACSB) curriculum content in relation to “Information technology and statistics/quantitative methods impacts on business practices to include data creation, data sharing, data analytics, data mining, data reporting, and storage between and across organizations including related ethical issues” as well as “Making sound decisions and exercising good judgment under uncertainty” (see page 33 of http://www.aacsb.edu/~media/AACSB/Docs/Accreditation/Standards/2013-business-standards.ashx accessed on 1/12/2015).

MBA Program Goals:

MBA students will:
- Develop a solid foundation in theoretical concepts and managerial skills needed to lead business organizations.
- Be able to analyze environments in which managers make and implement business decision.
- Be able to formulate, communicate, and coordinate strategies to solve business problems and pursue opportunities.

MIS 749 contributes to these goals through its student learning outcomes:
- Explain the strategic role of business analytics in the organization.
- Identify and Apply one or more predictive modeling techniques.
- Identify and Apply one or more classification techniques.
- Use association analysis to discover relationships between sets of items.
- Evaluate the effectiveness of business analytics initiative.
- Present the results of a business analytics initiative using graphics, text, and the spoken word.

Grading:
Grades are determined by performance on assignments and exams. A weighted average will be calculated using the following weights:

Case Assignments: 10%
Midterm: 25%
Final Exam: 30%
Project: 35%

Letter grades will be assigned based on a curved distribution of the class performance. The instructor reserves the right to adjust the weights for the class should circumstances warrant doing so. Students will be notified should this occur.
Attention Students with Disabilities

Please be assured that I will do all that I can to help provide accommodations for students with disabilities. I include the following note provided from Student Disability Services:

*If you are a student with a disability and believe you will need accommodations for this class, it is your responsibility to contact Student Disability Services at (619) 594-6473. To avoid any delay in the receipt of your accommodations, you should contact Student Disability Services as soon as possible. Please note that accommodations are not retroactive, and that I cannot provide accommodations based upon disability until I have received an accommodation letter from Student Disability Services. Your cooperation is appreciated.*

Cheating and Plagiarism

Cheating and plagiarism will not be tolerated in this class. Please review the University Policy file with respect to cheating and plagiarism. The following excerpt provides definitions of each:

Cheating shall be defined as the act of obtaining or attempting to obtain credit for academic work by the use of dishonest, deceptive, or fraudulent means. Examples of cheating include, but are not limited to (a) copying, in part or in whole, from another’s test or other examination; (b) discussing answers or ideas relating to the answers on a test or other examination without the permission of the instructor; (c) obtaining copies of a test, an examination, or other course material without the permission of the instructor; (d) using notes, cheat sheets, or other devices considered inappropriate under the prescribed testing condition; (e) collaborating with another or others in work to be presented without the permission of the instructor; (f) falsifying records, laboratory work, or other course data; (g) submitting work previously presented in another course, if contrary to the rules of the course; (h) altering or interfering with the grading procedures; (i) plagiarizing, as defined; and (j) knowingly and intentionally assisting another student in any of the above.

Plagiarism shall be defined as the act of incorporating ideas, words, or specific substance of another, whether purchased, borrowed, or otherwise obtained, and submitting same to the university as one’s own work to fulfill academic requirements without giving credit to the appropriate source. Plagiarism shall include but not be limited to (a) submitting work, either in part or in whole, completed by another; (b) omitting footnotes for ideas, statements, facts, or conclusions that belong to another; (c) omitting quotation marks when quoting directly from another, whether it be a paragraph, sentence, or part thereof; (d) close and lengthy paraphrasing of the writings of another; (e) submitting another person’s artistic works, such as musical compositions, photographs, paintings, drawings, or sculptures; and (f) submitting as one’s own work papers purchased from research companies.
Project in Business Analytics

Students will work in project groups of three to five members to complete a business analytics project. The project can be focused on either a specific organization or a general research question:

*Organizational Application:* Select a for-profit, non-profit or government agency and apply the techniques used in this course to help assist them in organizational decision making. The project will include an overview of the company and the industry in which it operates, the opportunity or challenge you are attempting to address through business analytics, and the results of your efforts. As part of the project, students should apply multiple techniques (e.g., logistic regression and k-nearest neighbors) and compare and contrast their results using the evaluation techniques covered in the course. A cost-benefit analysis is required as part of this project deliverable.

*Research Question:* Identify a research question you would like to address through use of the techniques and applications covered in this course. The project will include an argument stating the importance of your research question, your hypotheses, the methodology used and source of the data and a write-up of your results and implications. This project will be held to the standards of publishable research.

Your instructor will provide additional details on the projects in class including a specific schedule of deliverables.
### Tentative Course Outline

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Lecture Topics</th>
<th>Chapter(s)</th>
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<tbody>
<tr>
<td>1</td>
<td>Jan. 21</td>
<td>Introduction to Course, Overview of the Data Mining Process, Review of Statistical Concepts</td>
<td>1, 2</td>
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<tr>
<td>2</td>
<td>Jan. 28</td>
<td>Data Visualization, Pivot Tables</td>
<td>3, 4</td>
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<tr>
<td>2</td>
<td>Feb. 4</td>
<td>Evaluating Classification and Predictive Performance</td>
<td>5</td>
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<tr>
<td>3</td>
<td>Feb. 11</td>
<td>Multiple Linear Regression and Model Building</td>
<td>6</td>
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<tr>
<td>3</td>
<td>Feb. 18</td>
<td>K-Nearest Neighbors (k-NN)</td>
<td>7</td>
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<tr>
<td>5</td>
<td>Feb. 25</td>
<td>Logistic Regression</td>
<td>10</td>
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<tr>
<td>6</td>
<td>Mar. 4</td>
<td><strong>Midterm</strong></td>
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<td>7</td>
<td>Mar. 11</td>
<td>Cluster Analysis</td>
<td>14</td>
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<td>8</td>
<td>Mar. 18</td>
<td>Cluster Analysis Continued</td>
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<td>9</td>
<td>Mar. 25</td>
<td>Association Rules</td>
<td>13</td>
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<td>10</td>
<td>Apr. 1</td>
<td>Spring Recess / No Class</td>
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<tr>
<td>11</td>
<td>Apr. 8</td>
<td>Forecasting Part 1</td>
<td>15, 16</td>
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<td>12</td>
<td>Apr. 15</td>
<td>Forecasting Part 2</td>
<td>16, 17</td>
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<td>13</td>
<td>Apr. 22</td>
<td>Special Topics in Business Analytics</td>
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<td>14</td>
<td>Apr. 29</td>
<td>Project Presentations</td>
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<tr>
<td>15</td>
<td>May 6</td>
<td>Project Presentations</td>
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**Final Exam** – Date and Time to be determined after census