Analytic competency is becoming tremendously important in the business world and is often the factor that distinguishes leading firms in any industry. Companies like Netflix, Marriott International, Capital One and Progressive Insurance have succeeded in their industries mainly due to their distinctive analytic competencies. This course is intended to provide an introductory overview of business analytics, emphasizing how firms implement data-driven decision making. Students will learn statistical concepts as well as an overview of different types of analytics methodologies, use spreadsheet modeling and learn through a mix of lectures, cases, practice problems and class discussion. An important goal of the course is to make students understand and implement fact-based decision making and to enable them to craft “business experiments” in order to make managerial decisions.

Topics include data analysis, sampling, hypothesis testing, regression modeling, experimental design, analysis of variance, text mining, web analytics, and social media analytics.

Case studies and hands-on assignments will introduce students to current business applications and innovative use of these ideas.
Course Objectives

Specifically the course aims to help you:

- understand the basic foundations of business analytics and vocabulary
- make business decisions based on data by applying hypothesis testing
- develop regression models for predictive analytics
- develop skills to design and perform experiments for gathering data
- articulate big-data analytics features
- understand the concepts underlying text mining, web analytics, retail analytics and social media analytics
- develop hands-on analysis skills to work with data
- apply the concepts in the context of practical business scenarios

Required Course Materials

Required Texts:

Statistics for Business & Economics, 13th Edition

This book is available in different formats – hard cover, loose leaf, and e-text. Choose the version that works best for you.

HBR Case Pack (Case Studies and article):
1. Pilgrim’s Bank (case)
2. Apollo Hospitals (case)
3. Quality Alloys (case)
4. Social Media Analytics (book chapter) - Peer Influence Analysis: Using Social Technologies to Identify Your Business's Most Influential Customers, Josh Bernoff; Ted Schadler

These cases can be purchased from the Harvard Business School Press Coursepack link: http://cb.hbsp.harvard.edu/cbmp/access/74229370

Articles (Suggested readings – free access -- available from Rutgers library at libraries.rutgers.edu)

Other readings (articles, chapters, business clippings and web sites) will be assigned regularly.
   1. Text Mining Supplement.
   2. Web Mining Supplement
   3. Big Data Supplement
   4. CHAID segmentation Supplement
   5. Market Basket Analysis Supplement

Software: The “official” software for the class will be MS Excel (with some add-on programs as required). In an optional module, students will also be introduced to the “R” Language which is extensively used for data analytics.

Prerequisite

The material covered in “Quantitative Business Skills” is the prerequisite for this course. You should also be comfortable in working with MS Excel.

Class Materials

Most class materials can be obtained via Sakai. I expect to post the lecture materials for a particular week before the start of the class.

Class Communication / Email Communication

Depending on the pace of our progress, some changes to the schedule will be announced in class. Please keep track of announcements. Note that all class e-mail communication will be via your Rutgers e-mail. Note that during the week, from Monday until Friday, I will try reply to all e-mails within 24 hours, unless I am traveling. Although, I check my e-mails few times a day, I may not be able to completely answer all e-mails immediately upon receiving them. Note that I usually am not be available on weekends and may not be able respond to weekend e-mails until Monday.
Course Requirements

The requirements for the course follow.

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participation</td>
<td>12 %</td>
</tr>
<tr>
<td>Case write-ups /</td>
<td>16 %</td>
</tr>
<tr>
<td>Presentation</td>
<td></td>
</tr>
<tr>
<td>Exam 1</td>
<td>22 %</td>
</tr>
<tr>
<td>Exam 2</td>
<td>22 %</td>
</tr>
<tr>
<td>Final Exam</td>
<td>28 %</td>
</tr>
</tbody>
</table>

Class Participation

The course will be delivered using a combination of class lectures, online sessions, case discussions, presentations, and hands-on sessions. Each one of you is expected to prepare for class discussions as indicated in the course schedule, to attend classes, and to contribute to class discussions. In evaluating class participation, I emphasize the quality of participation more than quantity. I try to assess how your contributions enhance both the content and process of a discussion:

- do your comments provide new insights?
- do the comments add to our understanding of the issues or is it frivolous -- an attempt to get "air time" that day?
- are the comments timely and linked to the comments of others?
- are the comments action-oriented or are they simply descriptive statements?
- do the comments move the discussion along by giving a new perspective?
- are the comments clear and concise or obscure and rambling?
- do the comments reflect a concern for maintaining a constructive and comfortable classroom atmosphere?

In addition, you are encouraged to identify and discuss any current news items from business press reports related to the course material.

Individual Assignments

Homework problems for practice will be assigned regularly. They are very helpful in mastering the material and getting comfortable with data analysis.

I expect that there will be about 8 practice homework assignments to be completed by each student individually. Most will require some use of MS Excel. These are not graded and there is no need to turn in the assignments.
Case Studies (Team Work)

Case studies in this course are used to reinforce the learning by applying concepts to new contexts. The cases may be analyzed as team work. Expected team sizes will be announced.

Each team is required to prepare a short analysis of assigned cases. Submit a short report (not exceeding 5 pages; appendices if any, may be added), with clear recommendations and rationale for your recommendations. Cover the issues raised in the discussion questions. Please submit case reports via the Assignment tool in Sakai and hand-in a paper copy as well.

In addition, each team will make a presentation on one of the business areas of application of analytics. These presentation are scheduled towards the end of the term.

Exam Policy

Three exams are planned. All students will take the exams during the designated time. **Make-up exams are typically not offered.** Please take this exam schedule into consideration when you make your travel arrangements. All exams will be given in the regular classroom unless otherwise posted. If you have to miss a test for emergencies / university approved reasons, contact me for making alternative arrangements.

Grading Policy

Students will be assigned a final grade based on the weighted scored computed using the components indicated above. The final grade will be based very approximately on a normal distribution.

Other Administrative Comments

- **Student Involvement:** You are encouraged and expected to ask questions and to interact with the instructor in class. If at any time during the course, you have questions regarding course-related matters, do not hesitate to contact me. If the scheduled office hours are inconvenient for you and if you want to meet in person, please contact me to arrange an alternative appointment.

- **Feedback:** I welcome your feedback on the content and style of the class. You may choose to provide your feedback in person, via e-mail, or anonymously at any time. Your suggestions will help me to make the class more useful for everybody.
• **Announcements:** Announcements will be periodically made about changes in schedules, assignments, exam, readings, project, policies and other class activities via email and in Sakai. Please keep abreast of the announcements and changes.

• **Direct Interaction:** In a course like this, sometimes, a direct one-to-one professional interaction to resolve difficult technical issues may be the most effective. For example, you may have a certain technical/mathematical problem that is frustratingly difficult to solve and may not be resolved in the class room or elsewhere. Please feel free to reach me during office hours or other times. I will also be able to meet with you personally, work with you over the phone or using the on-line collaborative tools.

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**Academic Integrity:**

“Academic integrity requires that all academic work be wholly the product of an identified individual or individuals. Joint efforts are only legitimate when the assistance of others is explicitly acknowledged…. The principals of academic integrity entail simple standards of honesty and truth. Each member of the university has a responsibility to uphold the standards of the community and to take action when others violate them…. Students are responsible for knowing what the standards are and for adhering to them. Students should also bring any violations of which they are aware to the attention of their instructors.”

(Rutgers University Code of Academic Conduct, http://studentconduct.rutgers.edu/university-code-of-student-conduct)

Students are expected to know, understand and adhere to the policies on academic integrity outlined above. Procedures for violation of these policies outlined in the University Code of Academic Conduct will be followed. In all cases, you are responsible for preparing and entering your own work and properly referencing the work of others. Cheating, plagiarism, and other types of misconduct are not acceptable. For the policy on Academic Integrity please see: http://academicintegrity.rutgers.edu/policy-on-academic-integrity. You are free to discuss any part of the course materials with your classmates. However, you are not allowed to discuss (i.e., receive nor give any assistance on) any part of the exams with anyone.

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**Support Services**

The School of Business welcomes persons with disabilities to all its classes, programs, and events. Students seeking an accommodation because of a disability may go to http://learn.camden.rutgers.edu/disability/disabilities.html or they can contact the Camden campus Disability Coordinator, Mr. Tim Pure at 856-225-6442, Armitage Hall Room 362, available via e-mail at disabilityservices@camden.rutgers.edu.
# COURSE OUTLINE (Tentative)

<table>
<thead>
<tr>
<th>Module</th>
<th>Date</th>
<th>Material</th>
<th>Reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Jan 18</td>
<td>Data analysis &amp; probability distributions review</td>
<td>Chapters 1 3 (prerequisites)</td>
</tr>
<tr>
<td>2</td>
<td>Jan 25</td>
<td>Data analysis &amp; probability review continued</td>
<td>Chapter 4 - 6 (prerequisites) Article #1</td>
</tr>
<tr>
<td>3</td>
<td>Feb 1</td>
<td>Sampling &amp; Interval Estimation</td>
<td>Chapters 7, 8</td>
</tr>
<tr>
<td>4</td>
<td>Feb 8</td>
<td>Hypothesis testing</td>
<td>Chapter 9 Case: Pilgrim Bank I</td>
</tr>
<tr>
<td>5</td>
<td>Feb 15</td>
<td>Hypothesis testing, Customer Analytics</td>
<td>Chapters 10 Case: Pilgrim Bank II (cont’d)</td>
</tr>
<tr>
<td>6</td>
<td>Feb 22</td>
<td>Exam 1</td>
<td>All materials from weeks 1-5</td>
</tr>
<tr>
<td>7</td>
<td>Mar 1</td>
<td>Regression modeling I</td>
<td>Chapter 14</td>
</tr>
<tr>
<td>8</td>
<td>Mar 8</td>
<td>Regression modeling II</td>
<td>Chapters 15 &amp; 16</td>
</tr>
<tr>
<td></td>
<td>Mar 12 - 18</td>
<td>Spring Break</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Mar 22</td>
<td>Logistic Regression Text Mining</td>
<td>Chapter 15 Case: Apollo Hospital Text mining supplement.</td>
</tr>
<tr>
<td>11</td>
<td>Mar 29</td>
<td>Exam 2</td>
<td>All materials from Weeks 7-10</td>
</tr>
<tr>
<td>12</td>
<td>Apr 5</td>
<td>Experimental Design, Analysis of Variance, Applications</td>
<td>Chapter 13 Articles #2, #3</td>
</tr>
<tr>
<td>13</td>
<td>Apr 12</td>
<td>Web Analytics, Big Data</td>
<td>Case: Quality Alloy Big Data supplement, Web mining supplement</td>
</tr>
<tr>
<td>14</td>
<td>Apr 19</td>
<td>Segmentation, Talent Analytics, Retail Analytics</td>
<td>CHAID supplement, Article # 4, Market Basket Analysis supplement</td>
</tr>
<tr>
<td>15</td>
<td>Apr 26</td>
<td>Social Media Analytics Information Security Review</td>
<td>Casepack: Peer Influence Analysis - Bernoff, Schadler Article #5</td>
</tr>
<tr>
<td>16/17</td>
<td>May 3</td>
<td>Final Exam</td>
<td>Comprehensive – All material from weeks 1 – 15</td>
</tr>
</tbody>
</table>

Note: Changes may be made to this tentative course outline as needed.