COURSE DESCRIPTION

Business intelligence (BI) is a set of technologies and processes that allow people at all levels of an organization to access, interact with and analyze data. In a data-rich business environment, BI can help a management team to operate efficiently, discover new market opportunities and improve business performance. This course focuses on data science techniques, analytical toolboxes and business applications in supply chain and marketing management.

The course is structured as a combination of lectures, in-class case studies and group projects. All data analysis, optimization and simulation models are implemented in R (https://cran.r-project.org/ and https://www.rstudio.com/). R is a powerful, extensible and free programming language, which is gaining popularity for data scientists and business analysts. Students are expected to learn how to integrate BI with supply chain and marketing management, improve their data/analytical skills and deepen their knowledge of supply chain and marketing science from a quantitative perspective.

The major learning approach of this course is through case-studies (in-class) and group projects (after-class). Case/project topics are drawn from various supply chain and marketing instances and a sample of these topics include:

I. DTP - Dynamic ticket pricing for sports games (data source: stubhub.com)
II. AQA - Quality assurance in automobile supplier-OEM relationships (data source: IQS from J.D. Power and warranty weeks)
III. Others (e.g., JD order fulfillment data) if time permits

COURSE MATERIALS

1. Recommended textbook: Business Intelligence, Analytics, and Data Science: A Managerial Perspective (by Ramesh Sharda, Dursun Delen Efraim Turban).
2. Recommended R programming books: R Cookbook (by Paul Teetor); R for Data Science (by Hadley Wickham and Garrett Grolemund); ggplot2 (by Hadley Wickham). PDF versions are free online.
3. Lecture slides, data and R files are available on blackboard before each class. Please check this site (http://blackboard.rutgers.edu) every week.

PREQUISITES

Operations Analysis (22:799:580)
ACADEMIC INTEGRITY

Academic integrity is essential to maintaining an environment that fosters excellence in teaching, research and other educational and scholarly activities. All suspected incidents of academic misconduct will be referred to an Academic Integrity Facilitator for investigation. Unfortunately, some Rutgers students are failed or suspended every year for violations of academic integrity. If you have any doubt what constitutes a violation of academic integrity, please visit the Student Judicial Affairs website http://academicintegrity.rutgers.edu/

Cheating is not tolerated at Rutgers University. Students are responsible for understanding the RU Academic Integrity Policy at: https://slwordpress.rutgers.edu/academicintegrity/wp-content/uploads/sites/41/2014/11/AI_Policy_2013.pdf This Policy is strongly enforced. On all examinations and assignments, students must sign the RU Honor Pledge, which states, “On my honor, I have neither received nor given any unauthorized assistance on this examination or assignment.” Written assignments will be screened through SafeAssign or Turnitin, plagiarism detection services that compare the work against a large database of past work. Don’t let cheating destroy your hard-earned opportunity to learn. For more details see: business.rutgers.edu/ai

ATTENDANCE AND CLASS PREPARATION POLICY

Attendance will be monitored selectively. Every student is expected to contribute to class discussions. Continuing, thoughtful and thorough participation in all aspects of the class will enable students to maximize their benefit from this course. Some ground rules include:

- This class requires that you bring a laptop (with R studio) in most sessions.
- Attend with an open mind – seek to learn.
- Engage in class discussions – focus on substance/quality.
- Keep your cell phone in silence.
- Please email the professor in advance, if you will be absent, late, or have to leave early.

If it is apparent that you have repeatedly missed class and/or are unprepared for the discussion, points will be taken off your class participation grade.

Expect me to attend all class sessions. I expect the same of you. If I am to be absent, I will send you notice via email and Blackboard as far in advance as possible. If you are to be absent, report your absence in advance by sending me an email with the details and supporting documentation and report at: https://sims.rutgers.edu/ssra/

For weather emergencies, consult the campus home page. If the campus is open, class will be held.

HOMEWORK SETS

After-class exercises are occasionally given and based on extensions of in-class case studies and course materials. Homework is graded by efforts.

TEAM PROJECT
Students are required to form a team (with three members). Each team needs to identify a real-world data set (not too small!) in the supply chain or marketing area, propose several meaningful managerial questions that can be answered by the data set, use R to analyze the data set and draw managerial insights. A list of data sets will be suggested in class.

Each team needs to make a project proposal on Apr 4 (15-20 minutes). The ppt proposal should cover data source, research questions and preliminary description/visualization of the data set.

Each team needs to present their final results on May 2 or 9 (30 minutes). The final report (30-40 pages) is due on May 9.

Grade criteria – find a rich data set, propose/answer interesting managerial questions, build appropriate decision models, conduct clean data analysis via R, and write an informative report!

In the project report, each team needs to report the effort contribution of its team members (e.g., 30%, 30% and 40%). A student who makes less than 20% contribution will receive point deduction.

EXAM DATES AND POLICIES

Exam One:
The in-class exam will be held on Mar 28. Exam questions are based on extensions of in-class case studies (DTP) and course materials covered before spring break. Students are required to use R to analyze data and draw correct managerial insights from data outputs. There are no conceptual questions on the exam.

Exam Two:
The in-class exam will be held on Apr 25. Exam questions are based on extensions of in-class case studies (AQA) and course materials covered after spring break. Students are required to use R to analyze data and draw correct managerial insights from data outputs. There are no conceptual questions on the exam.

Exams are open-book and open-notes. NO MAKE-UP EXAMS WILL BE GIVEN. A brief review of the material to be covered in the exam will be part of the lecture before each exam.

If you have a disability that influences testing procedures, provide me an official letter from the Office of Disability Services at the start of the semester.

GRADING POLICY

Each component will be accounted for a percentage weighed toward your numerical course grade (max 100 pts) as follows:
Your course numerical grade will be translated into your course letter grade as follows:

**Final Letter Grades:** Letter grades will be curved! The average class GPA is targeted to 3.4-3.6

~40% of A/A-; ~60% of B+/B/B-; ~10% C+/C/C-; optional F.

**No extra credits!** If you want to achieve a satisfactory grade, work **hard** on the team project and two exams.

**No excuses** will be accepted after I release the letter grade.

**SUPPORT SERVICES**


If you are a military veteran or are on active military duty, you can obtain support through the Office of Veteran and Military Programs and Services: [http://veterans.rutgers.edu/](http://veterans.rutgers.edu/)

If you are in need of legal services, please use our readily available services: [http://rusls.rutgers.edu/](http://rusls.rutgers.edu/)

**COMMUNICATION WITH YOUR INSTRUCTOR**

Email is the best way to communicate with your instructor. When sending email to your instructor, please sign your message with your first and last name.

**Please use your rutgers.edu email** whenever possible and put 22:799:670 plus the section number in the subject line. Emails with no subject line or an unidentifiable name may be deleted as a protection against computer viruses.

**COURSE SCHEDULE**

*BI Course Weekly Schedule – Spring 2020*

(This is a tentative schedule and is subject to change)
<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topics</th>
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<tbody>
<tr>
<td>1</td>
<td>25-Jan</td>
<td>Course overview; BI concepts</td>
</tr>
<tr>
<td>2</td>
<td>1-Feb</td>
<td>R-tutorial</td>
</tr>
<tr>
<td>3</td>
<td>8-Feb</td>
<td>R-tutorial (ggplot2, tidyverse, etc.)</td>
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<tr>
<td>4</td>
<td>15-Feb</td>
<td>Case DTP: Dynamic ticket pricing</td>
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<td>5</td>
<td>22-Feb</td>
<td>Case DTP: Dynamic ticket pricing</td>
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<tr>
<td>6</td>
<td>29-Feb</td>
<td>Case DTP: Dynamic ticket pricing</td>
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<tr>
<td>7</td>
<td>7-Mar</td>
<td>Generalized Linear Models</td>
</tr>
<tr>
<td>8</td>
<td>3/14 and 3/21</td>
<td>spring break - no classes</td>
</tr>
<tr>
<td>9</td>
<td>28-Mar</td>
<td>Exam 1</td>
</tr>
<tr>
<td>10</td>
<td>4-Apr</td>
<td>Project proposal</td>
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<tr>
<td>11</td>
<td>11-Apr</td>
<td>Case AQA: Quality assurance in auto industry</td>
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<tr>
<td>12</td>
<td>18-Apr</td>
<td>Case AQA: Quality assurance in auto industry</td>
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<tr>
<td>13</td>
<td>25-Apr</td>
<td>Exam 2</td>
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<tr>
<td>14</td>
<td>2-May</td>
<td>course wrap-up; Project presentation</td>
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<tr>
<td>15</td>
<td>9-May</td>
<td>Project presentation (Project Report Due)</td>
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