

**Supply Chain Management**  
**Course Number: 22:799:670**  
**Course Title: Supply Chain Business Intelligence**

## **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

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## **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 Canvas before each class. Please check this site (<http://Canvas.rutgers.edu>) every week.

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## **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.

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## **PREREQUISITES**

Operations Analysis (22:799:580)

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## **ACADEMIC INTEGRITY**

*I do NOT tolerate cheating.* Students are responsible for understanding the RU Academic Integrity Policy (<http://academicintegrity.rutgers.edu/>)

I will strongly enforce this Policy and pursue *all* violations. 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.” I will screen all written assignments 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. See [business.rutgers.edu/ai](http://business.rutgers.edu/ai) for more details.

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## **ATTENDANCE AND 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 Canvas as far in advance as possible. If you are to be absent, report please 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.

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## **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.

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## **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 (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 () **or** () (30 minutes). The final report (30-40 pages) is due on ().

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.**

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## **EXAM DATES AND POLICIES**

### **Exam One:**

The in-class exam will be held on (). 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 (). 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.

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### GRADING POLICY

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

Attendance	5%
Homework	5%
Team Project	30%
Exam 1	30%
Exam 2	30%

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.

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### COURSE SCHEDULE

*BI Course Weekly Schedule –*  
**(This is a tentative schedule and is subject to change)**

Week	Topics
1	Course overview; BI concepts
2	R-tutorial
3	R-tutorial (ggplot2, tidyverse, etc.)
4	Case DTP: Dynamic ticket pricing
5	Case DTP: Dynamic ticket pricing
6	Case DTP: Dynamic ticket pricing
7	Generalized Linear Models
8	<i>- no classes</i>
9	<b>Exam 1</b>
10	Project proposal
11	Case AQA: Quality assurance in auto industry
12	Case AQA: Quality assurance in auto industry
13	<b>Exam 2</b>
14	course wrap-up; Project presentation
15	Project presentation ( <b>Project Report Due</b> )

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## SUPPORT SERVICES

If you need accommodation for a *disability*, obtain a Letter of Accommodation from the Office of Disability Services. The Office of Disability Services at Rutgers, The State University of New Jersey, provides student-centered and student-inclusive programming in compliance with the Americans with Disabilities Act of 1990, the Americans with Disabilities Act Amendments of 2008, Section 504 of the Rehabilitation Act of 1973, Section 508 of the Rehabilitation Act of 1998, and the New Jersey Law Against Discrimination. More information can be found at [ods.rutgers.edu](http://ods.rutgers.edu).

[Rutgers University-New Brunswick ODS phone (848)445-6800 or email [dsoffice@echo.rutgers.edu](mailto:dsoffice@echo.rutgers.edu)]

[Rutgers University-Newark ODS phone (973)353-5375 or email [ods@newark.rutgers.edu](mailto:ods@newark.rutgers.edu)]

If you are *pregnant*, the Office of Title IX and ADA Compliance is available to assist with any concerns or potential accommodations related to pregnancy.

[Rutgers University-New Brunswick Title IX Coordinator phone (848)932-8200 or email [jackie.moran@rutgers.edu](mailto:jackie.moran@rutgers.edu)]

[Rutgers University-Newark Office of Title IX and ADA Compliance phone (973)353-1906 or email [TitleIX@newark.rutgers.edu](mailto:TitleIX@newark.rutgers.edu)]

If you seek **religious accommodations**, the Office of the Dean of Students is available to verify absences for religious observance, as needed.

[Rutgers University-New Brunswick Dean of Students phone (848)932-2300 or email [deanofstudents@echo.rutgers.edu](mailto:deanofstudents@echo.rutgers.edu)]

[Rutgers University-Newark Dean of Students phone (973)353-5063 or email [DeanofStudents@newark.rutgers.edu](mailto:DeanofStudents@newark.rutgers.edu)]

If you have experienced any form of **gender or sex-based discrimination or harassment**, including sexual assault, sexual harassment, relationship violence, or stalking, the Office for Violence Prevention and Victim Assistance provides help and support. More information can be found at <http://vpva.rutgers.edu>.

[Rutgers University-New Brunswick incident report link: <http://studentconduct.rutgers.edu/concern/>. You may contact the Office for Violence Prevention and Victim Assistance at (848)932-1181]

[Rutgers University-Newark incident report link: [https://cm.maxient.com/reportingform.php?RutgersUniv&layout\\_id=7](https://cm.maxient.com/reportingform.php?RutgersUniv&layout_id=7) . You may also contact the Office of Title IX and ADA Compliance at (973)353-1906 or email at [TitleIX@newark.rutgers.edu](mailto:TitleIX@newark.rutgers.edu). If you wish to speak with a staff member who is confidential and does **not** have a reporting responsibility, you may contact the Office for Violence Prevention and Victim Assistance at (973)353-1918 or email [run.vpva@rutgers.edu](mailto:run.vpva@rutgers.edu)]

If students who have experienced a temporary condition or injury that is adversely affecting their ability to fully participate, you should submit a request via <https://temporaryconditions.rutgers.edu> .

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/>

If you are in need of **mental health** services, please use our readily available services.

[Rutgers University-Newark Counseling Center: <http://counseling.newark.rutgers.edu/>]

[Rutgers Counseling and Psychological Services–New Brunswick: <http://rhscaps.rutgers.edu/>]

If you are in need of **physical health** services, please use our readily available services.

[Rutgers Health Services – Newark: <http://health.newark.rutgers.edu/>]

[Rutgers Health Services – New Brunswick: <http://health.rutgers.edu/>]

If you are in need of *legal* services, please use our readily available services: <http://rusls.rutgers.edu/>

Students experiencing difficulty in courses due to *English as a second language (ESL)* should contact the Program in American Language Studies for supports.

[Rutgers–Newark: [PALS@newark.rutgers.edu](mailto:PALS@newark.rutgers.edu)]

[Rutgers–New Brunswick: [eslpals@english.rutgers.edu](mailto:eslpals@english.rutgers.edu)]

If you are in need of additional *academic assistance*, please use our readily available services.

[Rutgers University-Newark Learning Center: <http://www.ncas.rutgers.edu/rlc>

[Rutgers University-Newark Writing Center: <http://www.ncas.rutgers.edu/writingcenter>]

[Rutgers University-New Brunswick Learning Center: <https://rlc.rutgers.edu/>]

[Optional items that many faculty include:

- Students must sign, date, and return a statement declaring that they understand the RU Academic Integrity Policy.

- Students must sign, date, and return a statement declaring that they understand this syllabus.]