Management Science and Information Systems
Course Number: 29:623:335
Course Title: Data Warehousing and Data Mining

COURSE DESCRIPTION

The primary focus of this course is on Data Warehousing and Data Mining. For the Data warehouse side, we will be concentrating on requirements gathering for data warehousing, data warehousing architecture, dimensional model design, multidimensional and tabular data bases, extracting, transforming, and loading process, on-line cubes, off-line cubes, OLAP consumption using Business Intelligence. For the Data mining side, we will be concentrating on finding patterns, supervised, and unsupervised algorithms.

COURSE MATERIALS

Required Textbook(s):

- Title: The Data Warehouse Toolkit: The Definitive Guide to Dimensional Modeling 3rd Edition   • Edition: 3rd.
- Year:2012
- Authors: Ralph Kimball and Margy Ross
- Editorial: Kimball Group

LEARNING GOALS AND OBJECTIVES

LGO1. Students will understand the current basic concepts in the functional areas of data warehousing and be able to create Multidimensional and tabular models to create OLAP CUBEs.

LGO2. Students will be able to understand how works the ETL process.

LGO3. Students will develop the ability to find patterns using data mining techniques.

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 for more details.

ATTENDANCE AND PREPARATION POLICY

- Expect me to attend all in-class sessions. I expect the same of you. If I am to be absent, my department chair or I will send you notice via email and Canvas as far in advance as possible. Some lectures may be provided via the web. In such a case you will be notified in advance to be present via your own computer and/or in class.

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

- Expect me to arrive on time for each class session. I expect the same of you.

- Expect me to prepare properly for each class session. I expect the same of you. Complete all background reading and assignments. You cannot learn if you are not prepared. The minimum expectation is that for each class session, you have prepared by studying for at least twice as many hours as the class hours.

- Expect me to participate fully in each class session. I expect the same of you. Stay focused and involved. You cannot learn if you are not paying attention.

CLASSROOM CONDUCT

- All cell phones should be turned off
- Please raise your hand before asking questions
- Refrain from side conversations, sleeping, and other disruptive behaviors.

EXAM DATES AND POLICIES

(NO MAKEUP EXAMS)

There are 3 exams in this course:

Exam 1:
Midterm 2:

Final Exam:

Exam Date:

During in-class exams, the following rules apply:

- 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.
- No cell phones or other electronics are allowed in the testing room.
- You must show a valid Rutgers photo ID to enter the room and to turn in the exam.
- Alternate seating; do not sit next to another student or in your usual seat.

GRADING POLICY

Course grades are determined as follows:

Quizzes & Assignments	10%
Exam 1	20%
Exam 2	30%
Final exam	40%
Extra credit:	None

Grade distribution:

Letter	Percentage
A	90-100
B+	87-89.99
B	80-86.99
C+	77-79.99
C	70-76.99
D+	67-69.99
D	60-66.99
F	<60

1. All examinations and quizzes, including the Final Examination, should be considered cumulative.
2. COURSE GRADE WILL BE ISSUED WHEN ALL COURSE REQUIREMENTS ARE

MET.

- Grade posting: Grades will be provided within two-weeks of an exam, assignment/paper submission, or quiz. Grades on hardcopy items will be provided in person in the class when the specific items are returned.

- Return of graded items: Graded items will be returned within two weeks in person for hardcopy items. Final exam and any final project reports will not be returned. Canvas for this course will be turned off and archived at the end of the final exam.

- Grade related information: No grade related information will be provided through email. All grade related information will be provided in person via appointments. It is expected that you are respectful when you review your grade with me and accept the grade you have earned. Please do not use abusive language in email or in person. Any instances of that will be reported according to university guidelines.

- Warning grade roster: Warning grades will be issued if needed. You must watch for warning grades.

- Pregrading & regrading: Requests to review assignments before final submission (pregrading) will be provided by appointment and primarily after class hours. Requests to regrade assignments. Quizzes, & exams must be done in writing to the instructor within one week of the specific items being returned. Regraded items will be delivered back to students in person during after class hours.

- Grade grubbing: Your final grade is not subject to negotiation. If you feel I have made an error, submit your written argument to me within one week of receiving your grade of the specific item. If you want me to review the final grade, submit your written argument to me within one week of receiving your final grade. Clarify the precise error I made and provide all due supporting documentation. If I have made an error, I will gladly correct it. But I will adjust grades only if I have made an error. I cannot and will not adjust grades based on consequences, such as hurt pride, lost scholarships, lost tuition reimbursement, lost job opportunities, or dismissals. Do not ask me to do so. It is dishonest to attempt to influence faculty in an effort to obtain a grade that you did not earn, and it will not work

COURSE SCHEDULE

(Tentative schedule, Subject to Change)

Week	Subjects
W1	Installation of multiple DW and DM platform Introduction to DATA WAREHOUSING • What is data warehousing? • Data warehousing project management and requirements gathering • Basic example? Power BI / GCP
W2	Technical architecture Fundamental Concepts Basic fact table techniques Basic dimension table techniques PostgresSQL

W3	Dimensional Modeling • Drilling Down, Snow flaked dimensions GCP/PowerBI/Tableu
W4	Dimensional Modeling Cases: Retails Sales, Inventory, Procurement, Order Management, Accounting, CRM, Human Resources Management,
W5	Multidimensional Database, ETL part 1 Cases: Financial services, Telecommunication, transportation, Education, Health Care, ecommerce, insurance
W6	Part 1: What is Data Mining? R- Statistical Package / POWER BI / MACHINE LEARNING / Python
W7	ETL part 2 DW Lifecycle Overview
W8	OLAP &Business Intelligence Sql Server Analysis Services
W9	OLAP & Business Intelligence GCP/PowerBI/Tableu
W10	Data aggregation, adding new dimensions and measures Data Cleaning. Tabular Model, Multidimensional Model
W11	Part 2: What is Data Mining? R- Statistical Package / POWER BI / MACHINE LEARNING / Python
W12	Anomaly detection Association rule learning (Dependency modelling) Clustering Big Data Analytics
W13	Part 1: Supervised and Unsupervised Machine learning Algorithms

W14	Part 2: Supervised and Unsupervised Machine learning Algorithms
W15	Project Presentation
W16	FINAL

Required application software:

- Google Clound Platfrom
- Microsoft Azure
- AWS
- Power Bi Desktop version (wwww.powerbi.com)
- R Studio

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.

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

[Rutgers University-Newark ODS phone (973)353-5375 or email 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]

[Rutgers University-Newark Office of Title IX and ADA Compliance phone (973)353-1906 or email 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]

[Rutgers University-Newark Dean of Students phone (973)353-5063 or email 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 . You may also contact the Office of Title IX and ADA Compliance at (973)353-1906 or email at 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]

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]

[Rutgers–New Brunswick: 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.]