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):

- 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.

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**GRADING POLICY**

Course grades are determined as follows:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quizzes &amp; Assignments</td>
<td>10%</td>
</tr>
<tr>
<td>Exam 1</td>
<td>20%</td>
</tr>
<tr>
<td>Exam 2</td>
<td>30%</td>
</tr>
<tr>
<td>Final exam</td>
<td>40%</td>
</tr>
</tbody>
</table>

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)

<table>
<thead>
<tr>
<th>Week</th>
<th>Subjects</th>
</tr>
</thead>
</table>
| 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/Tableau |
| W4 | Dimensional Modeling  
  Cases: Retail Sales, Inventory, Procurement, Order Management, Accounting, CRM, Human Resources Management, |
| W5 | Multidimensional Database, ETL part 1  
  Cases: Financial services, Telecommunication, transportation, Education, Health Care, e-commerce, 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/Tableau |
| 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 |
Part 2: Supervised and Unsupervised Machine learning Algorithms

Project Presentation

FINAL

Required application software:

- Google Cloud Platform
- Microsoft Azure
- AWS
- Power Bi Desktop version (www.powerbi.com)
- R Studio

SUPPORT SERVICES


[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.
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 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 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/](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](http://www.ncas.rutgers.edu/rlc)]

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

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