Syllabus

Course: CIS/CS 445 Database Management

Course Description:
Introduces core concepts in data management. Students identify organizational information requirements, convert conceptual data models into relational data models, apply normalization techniques, and utilize an Oracle relational database management system in a virtual lab environment.

Prerequisite Courses:
CS 310 Data Structures or equivalent transfer credit

Course Overview
In this course you will learn basic database concepts and theory, data modeling, logical and physical database design, and database implementation. Within these topics, you will get experience with an Oracle 12c relational database management system (DBMS) within a Virtual Lab. You will learn entity relation designing, creating tables, loading data, altering and updating tables throughout the course using Oracle database development tools. The course also touches on dynamic web databases, data warehouses and Big Data applications and technology and Tableau as a visualization tool attached to Oracle.

Course Outcomes
Upon the completion of this course, learners should be able to:
• Analyze the organizational business needs and their impact on the database environment.
• Formulate the database business rules necessary to support the organizational needs.
• Demonstrate the ability to perform ER modelling using current ER tools.
• Demonstrate entity relationship modeling, normalization, and the application of business rules.
• Implement a database schema using ANSI-Standard SQL and Oracle’s Relational Database Management System (RDBMS).
• Design, implement, and utilize business database management systems.
• Develop and execute SQL query statements in a real-world virtual lab environment.
• Analyze current trends related to Big Data.
• Differentiate between an Online Transaction Processing System (OLTP) and a data warehouse.
• Discuss data warehouse/data mart modeling approaches.
• Discuss the value of web-based database architecture components.
• Understand basic usage of Tableau and how to use it with an Oracle database.
Course Materials:

**Required Text(s)**

**Print Version:**
OR

**E-Textbook**
or

Note that your facilitator may provide additional required readings.

**Required Resources:**


**Library Tutorials:**

Research Tutorials and Guides. Regis University Library.
- All tutorials, see http://libguides.regis.edu/tutorials.
- Computer and Information Science (CIS)
  - Research Guide by Subject area, see http://libguides.regis.edu/computer_informationsciences?hs=a.
  - Research Tutorial, see https://mediaspace.regis.edu/media/Regis+Library+-+Resources+for+computer+and+information+science+/0_blk905nh/10579702

**Optional/Suggested Resources:**

Here are just a few (out of about 100) Oracle books online for free. These textbooks may help you in this course. To get to it: www.regis.edu ->Regis Library->A-Z Databases->Books24x7
- Practical Guide to Using SQL in Oracle
- Mastering Oracle SQL and SQL* Plus
- Purdue Online Writing Lab (OWL). Retrieved from https://owl.english.purdue.edu/owl/section/2/10/.
- Adobe Acrobat Reader, RealPlayer

**Technology Tools**


**Software:**

- CC&IS Virtual Lab (two options)
  1. The Oracle DBMS is freely available via the CC&IS Virtual Lab. You only need a web browser and cloud technology for the Virtual Lab. Technical Support will be available via
the Regis Database Practicum. Details on how to connect to the server are available in the Week 1’s To-Do List webpage.

- Data Modeling Tools
  - ERDPlus (required) is a data modeling software suite that was developed in conjunction with the textbook and is available for free to students at [https://erdplus.com/#/](https://erdplus.com/#/)

**Pre-Assignment**
Complete the assigned readings in the Course Activities and Assignments table below for Week 1

**Course Activities and Assignments:**

This course includes discussions, cases, a research paper, and two quizzes to measure student success.

<table>
<thead>
<tr>
<th>Week</th>
<th>Topics</th>
<th>Readings</th>
<th>Assignments and/or Assessments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Database Concepts,</td>
<td>Jukić, N., Vrbsky, S., and Nestorov, S. (2016) Ch. 1 &amp; 2</td>
<td>Introductions – initial response required by Wednesday of Week 1</td>
</tr>
<tr>
<td></td>
<td>Database Requirements</td>
<td>Appendix A. Enhanced ER From the Expert:</td>
<td>Discussion Questions</td>
</tr>
<tr>
<td></td>
<td>ER Modeling</td>
<td>-Database Concepts</td>
<td>CC&amp;IS Virtual Lab – Oracle Access</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-Historical Evolution of Database Systems</td>
<td>Obtain an Entity-Relationship Diagramming Tool, ERDPlus (recommended)</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Develop Entity Relationship Diagram for Investco Scout (Mini Case 1)</td>
</tr>
<tr>
<td>2</td>
<td>Update Operations</td>
<td>Jukić, N., Vrbsky, S., and Nestorov, S. (2016) Ch. 3 &amp; 4</td>
<td>Discussion Questions</td>
</tr>
<tr>
<td></td>
<td>Update Anomalies</td>
<td>Appendix B, notes on Normalization From the Expert:</td>
<td>Map relational schema for Midtown Memorial (Mini Case 7 chapter 3)</td>
</tr>
<tr>
<td></td>
<td>Normalization</td>
<td>-Relational Database Model</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>-Entity Relationship Diagram (ERD) Resources</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Structured Query Language (SQL)</td>
<td>Jukić, N., Vrbsky, S., and Nestorov, S. (2016) Ch. 5</td>
<td>Discussion Questions</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Practicing DDL and DML</td>
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</tbody>
</table>
| 4 | Structured Query Language (SQL) continued | Appendix C, ERP systems  
- Database Design Process  
- Introduction to SQL | Using Oracle  
HAFA SQL assignment |
|---|---|---|---|
| 5 | Database implementation and use.  
Appendix D. Data Governance and Master Data Management  
From the Expert:  
- Introduction to SQL | Discussion Questions  
Practicing DDL and DML Using Oracle  
Zagi SQL assignment |
| 6 | Data Warehousing, Data Mart Modeling, Data Warehouse Implementation and use.  
Big Data | Jukić, N., Vrbsky, S., and Nestorov, S. (2016) Ch. 6 & 7  
Appendix G. Data Mining  
From the Expert:  
- Database Transactions | Discussion Questions  
Mid-term mini case, MCS1  
Investco scout page 175  
Quiz, chapters 1-5 |
| 7 | DMBS Functionalities, Database Administration | Jukić, N., Vrbsky, S., and Nestorov, S. (2016) Ch. 8 & 9  
Appendix F. Distributed Databases, Parallel DBs, Cloud Computing  
Appendix J, Big Data  
From the Expert:  
- Data Warehouse | Discussion Questions  
Research Paper - Big Data  
Review of database integrity. Exercises E6.1 through E6.2L |
| 8 | Object Oriented Databases, Data Mining, and XML | Jukić, N., Vrbsky, S., and Nestorov, S. (2016) | Discussion Questions  
Tableau reporting with Oracle |
Summary of Assignments and Percentage Weight towards course grade:

<table>
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<tr>
<th>Assignments</th>
<th>Weighted Percentage</th>
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<tr>
<td>Discussion Questions / Participation (Weeks 1-8)</td>
<td>16%</td>
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<tr>
<td>Week 1: Practice ERD Assignment</td>
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<td>Week 2: Midtown Memorial Relational Schema</td>
<td>5%</td>
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<tr>
<td>Week 3: HAFA SQL assignment</td>
<td>5%</td>
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<td>Week 4: Zagi SQL assignment</td>
<td>8%</td>
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<td>Week 5: Mini Case – Investco Scout</td>
<td>8%</td>
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<td>Week 6: Database Integrity</td>
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<td>Week 6: Big data research paper</td>
<td>10%</td>
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<td>Week 7: Tableau/Oracle assignment: UFO sightings</td>
<td>10%</td>
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<tr>
<td>Week 8: Tableau/Oracle assignment: Journalist Deaths</td>
<td>10%</td>
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<tr>
<td>Quizzes (Weeks 5 &amp; 8)</td>
<td>16%</td>
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<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
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CC&IS Grading Scale:

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<th>Letter Grade</th>
<th>Percentage</th>
<th>Grade Point</th>
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<tbody>
<tr>
<td>A</td>
<td>93 to 100</td>
<td>4.00</td>
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<tr>
<td>A–</td>
<td>90 to less than 93</td>
<td>3.67</td>
</tr>
<tr>
<td>B+</td>
<td>87 to less than 90</td>
<td>3.33</td>
</tr>
<tr>
<td>B</td>
<td>83 to less than 87</td>
<td>3.00</td>
</tr>
<tr>
<td>B–</td>
<td>80 to less than 83</td>
<td>2.67</td>
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<tr>
<td>C+</td>
<td>77 to less than 80</td>
<td>2.33</td>
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<tr>
<td>C</td>
<td>73 to less than 77</td>
<td>2.00</td>
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<tr>
<td>C–</td>
<td>70 to less than 73</td>
<td>1.67</td>
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<tr>
<td>D+</td>
<td>67 to less than 70</td>
<td>1.33</td>
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<tr>
<td>D</td>
<td>63 to less than 67</td>
<td>1.00</td>
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<tr>
<td>D–</td>
<td>60 to less than 63</td>
<td>.67</td>
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<tr>
<td>F</td>
<td>Less than 60</td>
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Additional information about grading can be found in the latest edition of the University Catalog, available at [http://www.regis.edu/Academics/Course%20Catalog.aspx](http://www.regis.edu/Academics/Course%20Catalog.aspx).

CC&IS Policies and Procedures

Each of the following CC&IS Policies & Procedures is incorporated here by reference. Students are expected to review this information each term, and agree to the policies and procedures as identified here and specified in the latest edition of the University Catalog, available at [http://www.regis.edu/Academics/Course%20Catalog.aspx](http://www.regis.edu/Academics/Course%20Catalog.aspx) or at the link provided.

The CC&IS Academic Integrity Policy.

The Student Honor Code and Student Standards of Conduct.

Incomplete Grade Policy, Pass / No Pass Grades, Grade Reports.

The Information Privacy policy and FERPA. For more information regarding FERPA, visit the [U.S. Department of Education](http://www.ed.gov/family/fraud/ferpa.html).

The HIPPA policies for protected health information. The complete Regis University HIPAA Privacy & Security policy can be found here: [http://www.regis.edu/About-Regis-University/University-Offices-and-Services/Auxiliary-Business/HIPAA.aspx](http://www.regis.edu/About-Regis-University/University-Offices-and-Services/Auxiliary-Business/HIPAA.aspx).


The CC&IS Policies & Procedures Syllabus Addendum summarizes additional important policies including, Diversity, Equal Access, Disability Services, and Attendance & Participation that apply to every course offered by the College of Computer & Information Sciences at Regis University. A copy of the CC&IS Policies & Procedures Syllabus Addendum can be found here: [https://in2.regis.edu/sites/ccis/policies/Repository/CCIS%20Syllabus%20Addendum.docx](https://in2.regis.edu/sites/ccis/policies/Repository/CCIS%20Syllabus%20Addendum.docx).