DESCRIPTION

Theoretical and applied principles of relational database design. Includes relational theory, conceptual design, database normalization, relational database management systems, SQL queries and database management.

LEARNING OBJECTIVES

• To acquire knowledge of terminology and principles of relational database design
• To understand and apply the concepts of database development
• To design and create a small-scale non-bibliographic database

COURSE SCHEDULE

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Title</th>
<th>Readings</th>
</tr>
</thead>
</table>
| 1    | Jan.7 | Introduction Database basics | • Frost (2006), ch. 1  
|      |      |       | • Riordan (2005), preface |
| 2    | Jan.14 | Relational Theory  
|      |      | • Entity Relationship Diagram (ERD)  
|      |      | • Primary and foreign keys  
|      |      | • Relationships | • Frost (2006), ch. 2  
|      |      |       | • Riordan (2005), ch. 1 |
| 3    | Jan.21 | Conceptual Database Design  
|      |      | • Multiple table databases  
|      |      | • Lab: Creating tables and relationships in Access | • Frost (2006), ch. 3  
|      |      |       | • Riordan (2005), ch. 3 |
| 4    | Jan.28 | Database Design  
|      |      | • Problem statement and solutions  
|      |      | • Lab: Single-table queries in SQL and Access | • Frost (2006), ch. 8, 9  
|      |      |       | • Riordan (2005), part I, ch. 5 |
| 5    | Feb.4 | In class quiz (20%) | • Review of Frost (2006), ch. 1, 2 and 3  
|      |      |       | • Review of Riordan, ch. 1, 3 and 5. |
| 6    | Feb.11 | Advanced database design  
|      |      | • Recursive relationships  
|      |      | • Hierarchies  
|      |      | • Lab: Implementing advanced design in Access | Frost(2006), chapter 5 |
| 7    | Feb.18 | Database normalization  
|      |      | • 1NF, 2NF, 3NF, 4 NF, BCNF, 5NF  
|      |      | • Lab: Complex queries in Access | • Frost (2006), ch. 4  
|      |      |       | • Riordan, part I, ch. 2 |
Textbooks

The following textbooks are all freely available from McGill libraries.


Assessments

Assignment (10%, pairs)

You will work in pairs. Describe your database in terms the following parts:

1. a clear statement of the purpose, objectives and end-users of the database
2. an analysis of the problem context in terms of entities, fields, relationships and data types with a normalized Entity-Relationship Diagram

Two Quizzes (2 × 20%, individual)

Two in-class quizzes worth 20% each based on the lectures, labs and readings.

- Quiz 1
  - Relational theory
  - Conceptual database design
  - Simple queries
• Quiz 2
  ◦ Complex Queries
  ◦ Normalization
  ◦ Advanced database design (recursions and hierarchies)

**Final Project (45%, pairs)**

The final project is comprised of the following:

• A usable, small-scale non-bibliographic database created in MSAccess (40/45 points)

  **Note:** Usable means that your database can be easily used and appreciated by your users with minimal training.

**Requirements**

• Minimum of 12 tables (including at least 4 associative tables)
• Minimum of 30 records in one of the primary tables
• Minimum of 20 records in the other primary tables
• Minimum of 10 records in the associative tables
• At least 2 forms to enter data in the main tables (in more than one table at a time)
• At least 2 reports to retrieve data from the main tables (from more than one table per report)
• A user manual, if you believe it is necessary. Assume users do not read help or user manuals. As much as possible, the interface should be self-evident and require no additional information to learn how to use.

**Presentation to the class (5/45 points)**

Imagine you are presenting your database to the client. Make sure a non-expert in databases can understand the solution, what it will do for them, and how it solves their current issues.

In no more than 10 minutes (+2 minutes for questions), all group members will present the result of their project. This should include:

1. The problem statement
2. The entity-relationship diagram, including recursive relationships and generalization/specialization hierarchies if appropriate to model your problem statement
3. The fully-normalized database using the interface for entering and retrieving data from the database with sample data (at least one report and form)

**Team Mate Assessment (2.5% for the assessor, 2.5% from the other team member)**

You will assess the overall performance of your team mate. The quality of the assessment will dictate your score on 2.5%, and the assessments from your team mate will greatly influence your score on 2.5%, as ultimately chosen by the instructor.

Your peer assessment should cover the following points:

• Describe the role taken and his/her ability to communicate and work with you.
• Describe the work performed and its quality.
• State whether or not you would be willing to work with this person again.
• Rate the person's overall performance on a scale of 1-10 points.

The assessment should be approximately **200-250 words**.

**Submitting your assignments**

• Your assignment must be submitted electronically using the Assignments tool in myCourses.
• Documents must be submitted electronically as an MS Word file (.doc or .docx) or alternately as a PDF file. All diagrams, tables, etc. must be inserted in your document: they cannot be submitted as separate files (.xls, .pdf, etc).

**General Information**

**Academic Integrity**

McGill University values academic integrity. Therefore, all students must understand the meaning and consequences of cheating, plagiarism and other academic offences under the Code of Student Council and Disciplinary Procedures.

**Academic Policies**

Additional policies governing academic issues which affect students can be found in the [McGill Charter of Students’ Rights](#).

**Language of Instruction**

All lectures, discussions, and course materials are in English. However, students have the right to submit their work in French.

**Students with disabilities**

If you have a disability please consult the [Office for Students with Disabilities](#).

**Acknowledgements**

This syllabus is largely based on the work of Prof. Catherine Guastavino.