

Database Design and Development

GLIS 657

Winter 2015

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WARNING: this syllabus is provided for informational use only. The specific content and assignments may change before the start of the course. Students of this course should not use this document but instead retrieve the official version that can be downloaded from the course management site.

Instructor: Prof. Charles-Antoine Julien <charles.julien@mcgill.ca>

Class times: Thursdays, 11:30 am - 2:30 pm

Location: EDU 624

Duration: Jan. 8th - Apr. 2nd, 2015

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

Week	Date	Title	Readings
1	Jan.8	Introduction Database basics	<ul style="list-style-type: none">• Frost (2006), ch. 1• Riordan (2005), preface
2	Jan.15	Relational Theory <ul style="list-style-type: none">• Entity Relationship Diagram (ERD)• Primary and foreign keys• Relationships	<ul style="list-style-type: none">• Frost (2006), ch. 2• Riordan (2005), ch. 1
3	Jan.22	Conceptual Database Design <ul style="list-style-type: none">• Multiple table databases• Lab: Creating tables and relationships in Access	<ul style="list-style-type: none">• Frost (2006), ch. 3• Riordan (2005), ch. 3
4	Jan.29	Database Design <ul style="list-style-type: none">• Problem statement and solutions• Lab: Single-table queries in SQL and Access	<ul style="list-style-type: none">• Frost (2006), ch. 8, 9• Riordan (2005), part I, ch. 5
5	Feb.5	In class quiz (20%)	<ul style="list-style-type: none">• Review of Frost (2006), ch. 1, 2 and 3• Review of Riordan, ch. 1, 3 and 5.
6	Feb.12	Advanced database design <ul style="list-style-type: none">• Recursive relationships• Hierarchies• Lab: Complex queries in Access	Frost(2006), chapter 5
7	Feb.19	Database normalization <ul style="list-style-type: none">• 1NF, 2NF, 3NF, 4 NF, BCNF, 5NF• Lab: Implementing advanced design in Access	<ul style="list-style-type: none">• Frost (2006), ch. 4• Riordan, part I, ch. 2

		Assignment (10%) due Friday the 20st at 11:59pm	
8	Feb.26	Designing the user interface Lab: Creating forms, subforms and reports	Riordan, part IV, ch. 15, 16.
9	Mar.5	Study Break	
10	Mar.12	In class quiz (20%) Lab: User interface Switch board in Access	
11	Mar.19	Database Maintenance Lab: User interface in Access continued	Review of Riordan (2005), 15, 16.
12	Mar.26	All teams submit slides before 6 pm the day before class (Mar.25) Student Presentations	
13	Apr.2	Student presentations	
14	Apr.9	Final Project (40%) due at 11:59pm Team Mate assessments (5%) due two days later on the 11th at 11:59pm.	

Textbooks

The following textbooks are all freely available from McGill libraries.

- Frost, R., Day, J. and Van Slyke, C. (2006). Database design and development. A visual approach. Pearson Prentice Hall, Upper Saddle River: NJ. (On reserve) <http://mcgill.worldcat.org/oclc/60419446>
- Riordan, R. (2005). Designing effective database systems. Addison-Wesley. Upper Saddle River, NJ. (Available online at McGill) <http://mcgill.worldcat.org/oclc/56672048>

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 (this usually requires no more than a page of textual description).
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)

All documentation is allowed up to 4 double sided 8.5 by 11 in. paper sheets. You can use both sides of the paper for total of 8 pages of notes. Notes can be in any format (e.g., printed, handwritten, etc.).

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 you 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, 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)

You will submit your slide deck (i.e., PowerPoint or PDF file) to myCourses.

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.

Assign a score to your teammate (1 to 5) that represents your willingness to work with this person again.

The teammate's assessment should be a maximum of **200-250 words** . Do not feel obliged to say anything if everything went well. The text should explain **only** less than perfect scores.

Submitting your assignments

- Your assignment must be submitted electronically using the Assignments tool in myCourses. Email submissions are not accepted.
- 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

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