Syllabus

This is the general syllabus for all sections of the course IT214. In addition to this syllabus each section may have additional requirements posted on the Blackboard.

Catalog Description

Covers fundamentals of relational database management systems and their use in business environments. Topics include: database classifications, data models with extensive coverage of the relational model, entity-relationship and extended entity-relationship models, normalization, advanced data modeling, and Structured Query Language (SQL) programming. Students design and implement a real-world relational database and create complex SQL queries to retrieve data from the database.

Expected outcomes

- Students understand and describe the database lifecycle and representative tools and methods involved.
- Students understand, develop, and analyze relational database models.
- Students understand and apply database model normalization.
- Students understand and describe the role and main elements of the Structured Query Language (SQL)
- Students understand, develop, and analyze SQL commands to create, update, and query a database.
- Students develop a small database based on real-world examples, by creating a model, implementing the model using SQL, populating the model with data and querying the model in a meaningful way.

Supported Student Outcomes at the Program Level

(1) An ability to analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.
(2) An ability to design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program’s discipline.
(6) An ability to identify and analyze user needs and to take them into account in the selection, creation, integration, evaluation, and administration of computing-based systems.

Prerequisites

IT103/IT104/CS112 with a minimal grade of C. Database knowledge taught in IT104 is required.
Online Session, GTA Office Hours

You must either participate or watch the recordings of the instructor online sessions. The GTA office hours are not recorded. The GTA will provide feedback based on a first come first served basis. Details are published on the Blackboard site of the course.

Instructor and GTA Information

You will find in the Welcome folder on Blackboard contact information for your instructor and GTA.

Course Coordinator

Dr. Mihai Boicu (Associate Professor)
Email: mboicu@gmu.edu (preferred communication method)

Please contact the course coordinator only after you discussed the issue with your GTA and course instructor. In the email subject please include the course number and section. The course coordinator will be contacted by the department or school for all the issues related to this course. Therefore, contacting first the course coordinator will determine a faster response.

Recommended Textbook

The following is the current recommended textbook, it is a special GMU edition of the textbook. You can purchase it at the GMU Bookstore at http://gmu.bncollege.com/ or online at another textbook vendor.

ISBN-10: 1111723990
Format: Paper
Publisher: Thomson Course Technology, 2010
Publisher’s web-site: www.cengage.com

The special GMU edition of the textbook listed above was created from two different textbooks:

- **Database Systems: Design, Implementation and Management** by C. Coronel, S. Morris, P. Rob
  ISBN-10: 0538748842

9th edition

- A Guide to MySQL textbook by P. Pratt, M. Last
  ISBN-10: 1418836354

1st edition

You can purchase two books that are used for the special GMU edition separately. If you do choose to acquire your textbooks separately, you may use newer editions as well, but some references may not be up to date. Other acceptable textbooks may be posted on the Blackboard.

Additional readings, tutorials and online materials will be recommended during the course.
While a textbook is not required, it is strongly recommended, mostly if you need a structured presentation of the material and you are less of a web-learner.

**Schedule (may be modified by the instructor)**

<table>
<thead>
<tr>
<th>Module</th>
<th>Week</th>
<th>Section</th>
<th>Homework / Exam</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>1</td>
<td>DB1. Introduction to databases</td>
<td>DB1 Assignment</td>
</tr>
<tr>
<td>Database</td>
<td>2</td>
<td>D1. Single entity design</td>
<td>D1 Assignment</td>
</tr>
<tr>
<td>Design</td>
<td>3</td>
<td>D2. Relationships</td>
<td>D2 Assignment</td>
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<tr>
<td></td>
<td>4</td>
<td>D3. Complex designs</td>
<td>D3 Assignment</td>
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<td></td>
<td>5</td>
<td>D4. Hierarchies</td>
<td>D4 Assignment</td>
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<tr>
<td></td>
<td>6</td>
<td>D5. Normalization and denormalization</td>
<td>D5 Assignment</td>
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<tr>
<td></td>
<td>7</td>
<td>Design Exam (Midterm 1)</td>
<td>Review</td>
</tr>
<tr>
<td>SQL</td>
<td>8</td>
<td>S1. Single table database</td>
<td>S1 Assignment</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>S2. Relationship implementation</td>
<td>S2 Assignment</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>S3. Joins</td>
<td>S3 Assignment</td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>S4. Subqueries</td>
<td>S4 Assignment</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>S5. Grouping</td>
<td>S5 Assignment</td>
</tr>
<tr>
<td></td>
<td>13</td>
<td>SQL Exam (Midterm 2)</td>
<td>Review</td>
</tr>
<tr>
<td>Database</td>
<td>6-8</td>
<td>P1. Database requirements</td>
<td>P1 Assignment</td>
</tr>
<tr>
<td>Project</td>
<td>8-10</td>
<td>P2. Database design</td>
<td>P2 Assignment</td>
</tr>
<tr>
<td></td>
<td>10-12</td>
<td>P3. Database development</td>
<td>P3 Assignment</td>
</tr>
<tr>
<td></td>
<td>12-14</td>
<td>P4. Database use</td>
<td>P4 Assignment</td>
</tr>
<tr>
<td>Final exam</td>
<td>15</td>
<td>Cumulative exam</td>
<td>Review</td>
</tr>
</tbody>
</table>

**Note:** The schedule may be changed during the semester to accommodate specific class needs. All changes will be posted on the Blackboard and communicated by email.
The following modules may be provided for extra-credit:

- Career module

**Grading:**

The students will be assigned a grade based on a weekly portfolio. Each module is graded independently.

- MODULE: Database design (30% = 5 sections x 4% each + 1 exam x 10%)
- MODULE: Database implementation in SQL (30% = 5 sections x 4% each + 1 exam x 10%))
- MODULE: Project (20% = 4 parts x 5% each)
- FINAL EXAM (20%)
- Additional bonus points might be provided during class for participation, extra assignments, extra curriculum activities, enrichment activities at the discretion of the instructor up to a total of around 3%.

The students may be required by the GTA or the instructor to have an online meeting and discuss the solution submitted to any of the assignments. A student who is not able to explain parts of the solution submitted will receive 0 points for the assignment and may be referred to the honor committee.

The grading scale for this course is:

<table>
<thead>
<tr>
<th>Numeric Grade</th>
<th>Letter Grade</th>
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<tbody>
<tr>
<td>97 – 100%</td>
<td>A+</td>
</tr>
<tr>
<td>93 – 96%</td>
<td>A</td>
</tr>
<tr>
<td>90 – 92%</td>
<td>A-</td>
</tr>
<tr>
<td>87 – 89%</td>
<td>B+</td>
</tr>
<tr>
<td>83 – 86%</td>
<td>B</td>
</tr>
<tr>
<td>80 – 82%</td>
<td>B-</td>
</tr>
<tr>
<td>77 – 79%</td>
<td>C+</td>
</tr>
<tr>
<td>73 – 76%</td>
<td>C</td>
</tr>
<tr>
<td>70 – 72%</td>
<td>C-</td>
</tr>
<tr>
<td>60 – 69%</td>
<td>D</td>
</tr>
<tr>
<td>0 – 59%</td>
<td>F</td>
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</tbody>
</table>

**Late Policy**

For full grade, students must submit all the work based on the due dates published on Blackboard. There are two exceptions to this rule.

**Non-academic exception:** The student must provide a documented case for a non-academic exception (e.g. doctor notice if an illness prevented the student to perform the course assignments). Contact information for any third party must be provided and written approval for the instructor to
contact the third party for confirmation. A new due date must be requested by the student. If the exception is approved by the instructor, the student may submit the work with no penalty.

**Late submission penalty:** For all submissions there is one day grace period, followed by a 10% of assignment points penalty each day (full or partial). For instance, a 4-point assignment submitted 2 days and 4 hours late that obtained 3 points will have an additional 0.8 penalty (one day grace period for first day, 0.4 penalty for the second day and 0.4 penalty for the partial third day). Therefore, the grade for the assignment is 2.2 points.

**Exams (during COVID)**

There are four exams in this course – 3 short one-hour exams, and the final exam. The exams must be taken during online session at the scheduled date. The student must have 2 devices.

- A computer prepared for a Blackboard Respondus with monitor exam (you must have microphone and video camera connected to the computer)
- A ZOOM connection (may be on a mobile device – phone, iPad or on another computer)

The exam must be taken in a quiet, isolated room. The ZOOM device must point from a short distance to the workplace showing, the computer monitor, student hands and face.

A pool of students may be selected for an oral examination based on the exam. The students in the pool will be selected on 2 criteria. (i) 3 students randomly (ii) around 7 based on the analysis of the monitor video and ZOOM connection. The students who are not able to explain correct solutions provided in the exam will have the grade for the exam changed to 0 and may be referred to the honor committee.

**Hardware and Software requirements**

For all sections you must have a personal computer with internet connection. It is strongly recommended that you have a powerful enough laptop on which you can perform code development that you can bring to class.

For the online section you must have a personal computer with internet connection, with video camera, speakers and microphone. Also you must have a mobile device with ZOOM installed, and having a video camera and microphone.

We require either a Mac OS X or Windows 10 computer.

**Course Delivery Methods**

The course will be delivered using various methods. You must have your MASON email account activated and you must check your email daily for announcements related to the course. You must have access to Blackboard Learning System and to know how to use its features.

There are video presentations posted on the Blackboard. You must have an environment in which you can watch these videos.

You will have several assignments and assessments to be performed each week. A summary of weekly requirements will be sent at the beginning of the week.
COURSE CANCELED (SNOW DAYS)

If the courses are canceled the first option is to have a synchronous meeting online during the same times. If you cannot be online the course will be recorded and posted on the course Blackboard site.

Intellectual Property

There is a strong recommendation that all work in the class projects to be done based on an open source license (e.g. Academic Free License http://en.wikipedia.org/wiki/Academic_Free_License). This will allow a rich, shared exchange of ideas and will allow each member of the class to further benefit with no restriction from the work performed in the class.

Privacy

Instructors respect and protect the privacy of information related to individual students. Specific issues relating to an individual student will be discussed via email, telephone or in person. Instructors will not discuss issues relating to an individual student with other students (or anyone without a need to know) without prior permission of the student. There is no guarantee related to the security of email and telephone conversations.

Assessable work other than final exams will be returned to individual students directly by the Instructor (or by a faculty or staff member or a Teaching Assistant designated by the Instructor, or via another secure method). Under no circumstances will a student's graded work be returned to another student.

Faculty and staff will take care to protect the privacy of each student's scores and grades.

Because of the nature of this class, some work performed by the student will be published and discussed in the class. Other students will be able to make comments and suggestions related to the published work, without seeing the actual grade the student earned for the work.

Disability Accommodations

The Office of Disability Services (ODS) works with disabled students to arrange for appropriate accommodations to ensure equal access to university services. Any student with a disability of any kind is strongly encouraged to register with ODS as soon as possible and take advantage of the services offered.

Accommodations for disabled students must be made in advance – ODS cannot assist students retroactively, and at least one week's notice is required for special accommodations related to exams. Any student who needs accommodation should contact the Instructor during the first week of the semester so the sufficient time is allowed to make arrangements.
Honor Code

All members of the Mason community are expected to uphold the principles of scholarly ethics. Similarly, graduating students are bound by the ethical requirements of the professional communities they join. The ethics requirements for some of the communities relevant to Applied IT graduates are available via the following links:

- ACM Code of Ethics and Professional Conduct
- IEEE Code of Ethics
- EC-Council Code of Ethics

On admission to Mason, students agree to comply with the requirements of the Mason Honor System and Code\(^1\). The Honor Code will be strictly enforced in this course. Honor Code cases are heard by a panel consisting of students – students who meet the requirements are encouraged to nominate themselves to serve on the Honor Committee.

Any use of the words or ideas of another person(s), without explicit attribution that clearly identifies the material used and its source in an appropriate manner, is plagiarism and will not be tolerated. There is a “zero tolerance” policy for plagiarism within The Volgenau School. The Instructor reserves the right to use manual and/or automated means (including such services as Turnitin.com) to detect plagiarism in any work submitted by students for this course, and to direct Teaching Assistants and/or other faculty and/or staff members to do likewise in support of this course.

For this course, the following requirements are specified:

- All assessable work is to be prepared by the individual student, unless the Instructor explicitly directs otherwise.

- All work must be newly created by the individual student for this course for this semester. Any usage of work developed for another course, or for this course in a prior semester, is strictly prohibited without prior approval from the instructor.

- For team work a summary at the end of the submission must identify mutually agreed individual contributions.

Students may seek assistance with assigned work (and are encouraged to do so if they feel the need), provided:

- The directions for the assigned work do not prohibit such assistance.

- Such assistance is acknowledged in the submitted work, clearly identifying the person(s) giving assistance and the nature of the assistance given.

\(^1\) Available at [http://catalog.gmu.edu/](http://catalog.gmu.edu/) and related Mason Web pages.
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- Any work to be submitted is prepared entirely and exclusively by the student submitting it. Students are expressly prohibited from sharing any assessable work for this course in any manner with other students (except students assigned as Teaching Assistants or Undergraduate Peer Mentors to this course and the student’s section), unless all students involved have had their work graded and returned by the Instructor, or the Instructor has explicitly approved such sharing.