IT 194: Review of Database Fundamentals

Catalog Description:

IT 194: Review of Database Fundamentals. (1 credit).

Provides a self-paced, comprehensive review of database fundamentals. 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. Open only to students with transfer credit comparable to IT 214 who have not attempted IT 194 or IT 214. Offered by Info Sciences & Technology. May not be repeated for credit.

Registration Restrictions:

Students with the terminated from VSE major attribute may not enroll.

Schedule Type: Lecture

Prerequisites:

Permission of department. (Students must have transferred a course comparable to IT 214 in order to be eligible to register for this course. For VCCS students, this course is typically ITD 256.)

This requirement will be strictly enforced. Any student who does not meet the prerequisite requirement will not be permitted to enroll in the course.

Expected outcomes:

On successful completion of this course, students will be able to:

• Use modern techniques of data organization and access in a database environment
• Describe the importance of database modeling and design
• Understand and work with the relational database model and ERD
• Design and create multiple tables, table relationships, and queries using SQL
• Understand what transaction management and concurrency control are
• Have solid understanding of different types of databases

Supported Student Outcomes at the Program Level:

(a) Apply knowledge of computing and mathematics.
(c) Design, implement and evaluate a computer-based system, process, component, or program.
(j) Ability to use and apply current technical concepts and practices in the core information technologies.
Sections
The course has one section AIT 194-001 (CRN: 21927)
  • Class lecture (5 lectures – 12 modules)
  • Tuesday & Friday 1:00 PM - 3:00 PM
  • Exploratory Hall L102
  • Session: Jan 04, 2018 - Jan 20, 2018

Course Coordinator / Section Instructor
Dr. Mihai Boicu, (Ph.D. in Information Technology)
  • Phone: (703) 993-1591 (M-F 9AM-3PM)
  • Email: mboicu@gmu.edu (start email subject with IT194-001)
  • Office hours by appointment (M-F 9AM-3PM)

Flipped Classroom
This section is taught as a flipped classroom. You are required to read the material in advance and
be prepared to apply the knowledge in exercises. In the classroom we will mainly perform exercises in
small teams (2-3 students) on whiteboards (walls).

Please view the following introductory video: https://www.youtube.com/watch?v=ojiebVw8O0g

Active Learning with Technology Classroom
This section is taught in one of the most modern classroom in George Mason University.

Please view the following introductory video: https://vimeo.com/90594960

Classroom Requirements
You must buy and bring to all the fours sessions of the class the following:

1. Laptop computer (Windows 10 or Mac OS X) - strongly recommended but not required
2. Expo Dry Erase Markers (4-5 colors) - required
3. Expo Dry Erase Erasers (1) - required
4. Photo camera (phone, tablet, computer camera is good)
5. Paper, pencils and eraser
6. Good hard candies for hard problems self-motivation (optional, as needed)
7. Textbook (strongly recommended)
Textbook

There is one required textbook for this course listed below. It is a special GMU edition of the textbook. You can purchase it at the GMU Bookstore at http://gmu.bncollege.com/

*Database Systems: Design, Implementation, and Management with Guide to MySQL, Special Edition for George Mason University, by Pratt, Last, Rob and Coronel*

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:

  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, please triple check the ISBN numbers so that you are obtaining the right textbooks and the right editions of the textbooks. **You are responsible for obtaining the correct textbooks for the course.**
## Schedule

<table>
<thead>
<tr>
<th>Module</th>
<th>Description</th>
<th>Readings (before class)</th>
<th>Homework (due next lecture)</th>
<th>L</th>
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<tbody>
<tr>
<td>DBMS-1</td>
<td>Database Systems</td>
<td>Database: Chapter 1</td>
<td>Quiz DBMS-1c Assignment DBMS</td>
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<tr>
<td>DBMS-2</td>
<td>Data Models</td>
<td>Database: Chapter 2</td>
<td>Quiz ERD-1c Assignment ERD-1</td>
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<tr>
<td>ERD-1</td>
<td>The relational database model</td>
<td>Database: Chapter 3</td>
<td>Quiz ERD-2c Assignment ERD-2</td>
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<tr>
<td>ERD-2</td>
<td>Entity Relationship Modeling</td>
<td>Database: Chapter 4</td>
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<tr>
<td>Project-1</td>
<td>Project – conceptual modeling</td>
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<tr>
<td>ERD-3</td>
<td>Advanced Data Modeling</td>
<td>Database: Chapter 5</td>
<td>Quiz ERD-3c Assignment ERD-3</td>
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<tr>
<td>ERD-4</td>
<td>Normalization of database tables</td>
<td>Chapter 6</td>
<td>Quiz ERD-4c Assignment ERD-4</td>
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<tr>
<td>Project 2</td>
<td>Project – ER specification</td>
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<td>2</td>
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<tr>
<td>ERD-R</td>
<td>Review</td>
<td>Chapter 1-6</td>
<td>Quiz ERD-R1</td>
<td>3</td>
</tr>
<tr>
<td>SQL-1</td>
<td>Sample databases</td>
<td>MySQL: Chapter 1</td>
<td>Assignment SQL-1</td>
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<tr>
<td>SQL-2</td>
<td>Introduction to SQL</td>
<td>MySQL: Chapter 3</td>
<td>Assignment SQL-2</td>
<td>3</td>
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<tr>
<td>Project 3</td>
<td>Project – Create Database</td>
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<td>Project-CD</td>
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<tr>
<td>ERD-R</td>
<td>Review</td>
<td>Chapter 1-6</td>
<td>Quiz ERD-R2</td>
<td>4</td>
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<tr>
<td>SQL-3</td>
<td>Single table queries</td>
<td>MySQL: Chapter 4</td>
<td>Assignment SQL-3</td>
<td>4</td>
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<tr>
<td>SQL-4</td>
<td>Multiple table queries</td>
<td>MySQL: Chapter 5</td>
<td>Assignment SQL-4</td>
<td>4</td>
</tr>
<tr>
<td>Project 4</td>
<td>Project – Queries</td>
<td></td>
<td>Project-Q</td>
<td>4</td>
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<tr>
<td>Final exam</td>
<td>Cumulative (MC + diagram)</td>
<td>All</td>
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<td>5</td>
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**Note:**
(L) = Lecture number

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.

No homework will be accepted after the final exam.

Due date delays are allowed only for non-academic reasons. Detailed explanation and official documentation must be provided.
Grading:

The students will be assigned a grade based on the following categories:

- Quizes (10%)
- Assignments (20%)
- Class participation (10%)
- Project (30%)
- Final exam (30%)
- Bonus points might be provided during class for participation, extra assignments, extracurriculum activities, enrichment activities at the discretion of the instructor

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>
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<tr>
<td>93 – 96%</td>
<td>A</td>
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<tr>
<td>90 – 92%</td>
<td>A-</td>
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<tr>
<td>87 – 89%</td>
<td>B+</td>
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<tr>
<td>83 – 86%</td>
<td>B</td>
</tr>
<tr>
<td>80 – 82%</td>
<td>B-</td>
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<tr>
<td>77 – 79%</td>
<td>C+</td>
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<tr>
<td>73 – 76%</td>
<td>C</td>
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<tr>
<td>70 – 72%</td>
<td>C-</td>
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<tr>
<td>60 – 69%</td>
<td>D</td>
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<tr>
<td>0 – 59%</td>
<td>F</td>
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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 speakers 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.

Exams

There is one main exam (final). The exams must be taken in class at the schedule date. For online sections the exam may be taken also in a pre-approved testing center. Exceptions must be well documented and approved based on MASON exams guidelines.

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.

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\(^1\) Available at [http://catalog.gmu.edu/](http://catalog.gmu.edu/) and related Mason Web pages.
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Syllabus

January 2018

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.
- Any work to be submitted is prepared entirely an 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.