Dr. Edward J. Garrity  
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Phone: 716-888-2267  
Fax: 716-888-2525

**Required Texts:**  
**Learning SQL by Example**, by Garrity, various handouts provided during the term.

**Office Hours:** 2:30-3:30 pm Monday & Wednesday & by appointment. Please call 716-888-2267 or email, Garrity@canisius.edu

**Note:** Use of Desire2Learn and email is mandatory. Students must check frequently.

**Course Objectives and Outcomes:** This course provides an introduction to Data Management and Database Management Systems (DBMS). Important fundamental concepts in the design and management of large databases are presented. The student is given hands-on experience with a commercial microcomputer DBMS (MS Access). Emphasis is on fundamental concepts, tools and methodologies involved in the design, implementation, and management of databases. Outcomes: Students will have gained skills in DBMS processing, learned new problem solving techniques and logic, and will have acquired skills in logical database design, SQL and information processing with a microcomputer DBMS. Certain advanced concepts and technologies will be covered, including client-server databases, big data and data mining, and access to databases over the Internet.

**Specific Course Objectives:** Student interaction and involvement in labs and in class course work is aimed at improving students’ analytical skills, reflective thinking (especially as it relates to design projects), oral communication skills (especially as students are required to work in groups or pairs to solve design problems and to formulate logical queries), written communication skills (as it relates to required, individual projects), and of course all of the course work helps to develop and improve students’ information literacy skills.

**All course goals can be found here:** [http://bit.ly/bcoreLG](http://bit.ly/bcoreLG)

Information Systems majors:

Objective 1A. Understand principles of systems analysis and design including the appropriate application of techniques to elicit and document user requirements of an information system;

Objective 1B. Understand the design principles of computer network architectures in order to be able to apply these principles to a business problem;

And especially:

Objective 1C: Apply principles of database design and effectively design database schemas based on conceptual business models.
Objective 2B: Apply concepts for effectively retrieving information from relational databases using ANSI structured query language (SQL).

AIS majors:
Goal 1: Graduates will be able to evaluate an organization’s system development process, the conceptual design of organizational systems and determine methods to provide information for business decision-making.

Objectives: Students will be able to:
B Apply principles of database design and effectively create database schemas based on conceptual business models.
C Apply concepts for effectively retrieving information from relational databases.

Note to students with disabilities:
"If you have any condition, such as a physical or mental disability, which will make it difficult for you to carry out the work as I have outlined it or which will require extra time on examinations, please notify me in the first two weeks of the course so that we may make appropriate arrangements. Thank you."

Lectures and Group Discussion:
Generally, Tuesday – lecture, section B, 11:30 to 12:45pm, OM 201, OR, section A, 1:00 to 2:15pm, OM 201, & Thursday –lab, both sections, Old Main Lab, OM 119.

Grading and Learning Strategies:

<table>
<thead>
<tr>
<th>Project 1</th>
<th>Project 2</th>
<th>Project 3</th>
<th>Project 4</th>
<th>Project 5</th>
<th>Project 6</th>
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</thead>
<tbody>
<tr>
<td>Reports, queries</td>
<td>Forms &amp; Queries, SQL-1</td>
<td>SQL–2, Design 1</td>
<td>Design 2</td>
<td>SQL-3</td>
<td>SQL-4</td>
</tr>
</tbody>
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Projects¹ (6 @ 10%) (Hands-on, learning & problem solving) 60%
Final Exam: (Individual hands-on, design skills, assessment) 30%
Instructor Evaluation (Labs – team learning, participation, attendance) 10%

Note: This course is 3 credits and required for IS & AIS. 100%

¹ Generally, late assignments are reduced 10% if received after they are due in class and by 20% after 1 day, but before the next penalty. Assignments are reduced by 50% at 1 week (e.g. due 9/11 turned in on 9/18) or if graded projects are returned to the class, whichever comes first.
### Tentative Course Outline

<table>
<thead>
<tr>
<th>Week of:</th>
<th>Topic</th>
<th>Readings &amp; Work</th>
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<tbody>
<tr>
<td>1. 9/1</td>
<td>What is data? What is a DB? Creating tables, DB fundamentals</td>
<td>Chapt. 1, 2, types of DB, MS Access</td>
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<tr>
<td></td>
<td>The Relational Model, Creating DBs &amp; tables, queries, simple reports</td>
<td>MS Access intro, Chapt. 1, 2</td>
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<tr>
<td>2. 9/8</td>
<td>Creating DBs &amp; tables, queries, simple reports, Intro E-R,</td>
<td>Chapt. 3 SQL, 4 ER</td>
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<tr>
<td>3. 9/15</td>
<td>Data Integrity, Queries, Forms, Simple Reports, SQL</td>
<td>Chapt. 1, 2, 3, 4, Project 1 due, reports</td>
</tr>
<tr>
<td>4. 9/22</td>
<td>Database Design, E-R, Forms</td>
<td>Chapt. 2, 4</td>
</tr>
<tr>
<td>6. 10/6</td>
<td>Data Modeling, SQL (2)</td>
<td>Chapt. 5, 2, 3</td>
</tr>
<tr>
<td>7. 10/15</td>
<td>Data Modeling, Converting to Relational tables, No classes Tuesday, 10/13</td>
<td>Chapt. 5</td>
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<tr>
<td>8. 10/20</td>
<td>Data Modeling, Normalization, SQL (2)</td>
<td>Chapt. 5, 4, 2, 3 Project 3, design 1</td>
</tr>
<tr>
<td>9. 10/27</td>
<td>Data Modeling, Normalization, SQL (2)</td>
<td>Chapt. 5, 2, 3, 4, G1</td>
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<tr>
<td>10. 11/3</td>
<td>Normalization, SQL, DDMC</td>
<td>Chapt. 3, 4, 5, 2, G1, Project 4 due, design</td>
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<tr>
<td>Week</td>
<td>Topic</td>
<td>Readings &amp; Work</td>
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<tr>
<td>11. 11/10</td>
<td>SQL, Visual Basic, <em>DDMC 1</em></td>
<td>Chapt. , G2</td>
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<tr>
<td>12. 11/17</td>
<td><em>DDMC 2</em>, SQL, Multi-User DBs</td>
<td>Chapt. 6, 7, 8 , Business Intelligence, 8. Project 5, SQL 2.</td>
</tr>
<tr>
<td>14. 12/1</td>
<td>Networks &amp; DBs, Data Mining, BI, Big Data</td>
<td>Chapt. 8, AJ, AK, Proj 6 (Thurs.),</td>
</tr>
<tr>
<td>15. 12/8</td>
<td>Review Sharing Data, Data Mining, BI, SQL</td>
<td>Chapt. 6, 7, 8, AJ, AK</td>
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**See Final Exam Schedule, Dec. 14-18**

**Notes:** Chapter readings are from the Kroenke Database Concepts textbook, unless prefixed with a ‘G.’ In other words, G1 refers to my first handout on SQL. **Policies:**

- **Attendance:** Students are expected to attend all classes. Reductions in final grade will occur for numerous absences.
- **Conduct:** Students are expected to conduct themselves in an ethical manner in this course.
- **Withdrawal:** Students may withdraw from the course prior to Friday, November 20th. Please see the College Catalog for additional details.
- **Having trouble?** Please contact me, using contact information at the top of the syllabus or please stop in Old Main 013 or call 716-888-2170. Visit the GRIFF Center webpage at: [http://www.canisius.edu/griff-center/](http://www.canisius.edu/griff-center/)

**Students must follow the Canisius policy on Academic Integrity:**

[http://www.canisius.edu/academics/integrity/ Academic Integrity Code]

**Chapter**

- **1** Getting Started (Introduction)
- **2** The Relational Model
- **3** Structured Query Language (SQL)
- **4** Data Modeling and the ER Model
- **5** Database Design (Transforming data model to designs)
- **6** Database Administration
- **7** Database Processing Applications
- **8** Big Data, Data Warehouses and BI
- **Appendix** J, BI, K Big Data

[www.pearsonhighered.com/kroenke](http://www.pearsonhighered.com/kroenke)
Data & Decision Making Complexity: Many people assume that all they need is the proper information and they can make the correct decision. However, the world is not always so simple. First, humans have a number of biases, or irrationalities, that cause bad decision making. Second we make assumptions about the world that are not always true. For instance, most business classes stress linear models. However, many real-world variables are non-linear. Second, our understanding of complex systems is often inadequate. We don’t typically account for stocks, flows, delays, non-linear variables, and how systems produce long-run dynamic change. We use a computer simulation and computer game to give students experience with complex systems. The game allows us to learn and evaluate risk and to see how complex systems behave.