

CMSC 461 Database Management Systems
Section 01 - MW 1:00 PM - 2:15 PM, Room: Sherman Hall 014
Section 02 - MW 2:30 PM - 3:45 PM, Room: Sherman Hall 014

Instructor: Dr. Jennifer Sleeman, jsleem1@cs.umbc.edu

Office Room Number: ITE 350 **Office Hours:** Tu 3:00-4:00 PM/Wed 10:00-11:30 AM and by Appointment.

TA: Joseph O'Malley, om4@umbc.edu

Office Room Number: ITE 340E **Office Hours:** 12PM - 2PM on Thursdays and 2PM - 4PM on Fridays

Textbooks: Abraham Silberschatz, Henry H. Korth, and S. Sudarashan, Database System Concepts, Sixth Edition, McGraw-Hill. ISBN-13: 978-0073523323 ISBN-10: 0073523321, website: <http://www.db-book.com>

Prerequisites: You must have completed CMSC341 or CMSC341H with the grade of C or better.

List of Topics:*

Introduction	approx 1 day
Relational Model	approx 3 days
SQL (Intro,Intermediate,Advanced)	approx 4 days
Database Design/E-R Model	approx 3 days
Relational Database Design/Normalization	approx 3 days
Data Storage and File Structure	approx 2 days
Indexing and Hashing	approx 2 days
Query Processing	approx 1 day
Transactions	approx 1 days
Concurrency Control	approx 3 days
Distributed Databases	approx 1 days
Big Data and NoSQL Databases	approx 3 day

Course Description (Official): This course covers database management and the different data models used to structure the logical view of databases. The course also covers database design and implementation techniques, including file organization, query processing, concurrency control, recovery, integrity and security.

*The list of topics and schedule is tentative and subject to change.

In this course we will mainly use Python as a programming language, SQL and MySQL database. However, we may also use other programming languages and other databases as part of our analysis.

Course Objectives: In this course we will develop a basic understanding of the fundamental concepts of relational database systems. We will learn the ER model and how it relates to the relational model. We will learn relational algebra and how it relates to a relational query language (SQL). We will understand how to normalize a database. We will briefly examine indexing and hashing, transactions, and concurrency. We will learn the basic principles of design, and development of applications that use a relational database system and how to connect to a relational database in Python. We will also introduce advanced concepts related to the World Wide Web, Cloud Computing and Big Data.

Student's Responsibility: The student is required to (1) complete reading and homework assignments, (2) complete a semester long project, and (3) take the midterm and final examination. In addition, the student is expected to attend lectures and participate in class discussions. Homework assignments will help you to keep on pace with the reading assignments and will support the development of a conceptual understanding. The project will help you apply this conceptual understanding to a practical problem. Finally, the examinations help one ensure they have mastered their understanding of the topics related to database systems.

Homework Assignments: There will be six homework assignments assigned throughout the semester. We will drop your lowest homework assignment grade. These homework assignments will support the assigned reading and will involve possibly design, analysis and source code development. These assignments differ from the project in that they are shorter and their deadlines are faster usually within 1 week of assignment.

- Details related to homework assignments can be found on the course web site.
- You may choose to do your homework assignments on the GL computers at UMBC or your personal computer, however your programs must run correctly on GL Linux computers at UMBC.
- Homework assignments are due on the due date by 11:00 pm. Homework assignment usually involve one or more of the following tasks diagramming, short answers, sql scripting and coding. Directions will be provided as to how to submit the homework.
- Starting at 11:01 pm, the homework assignment will be considered late which will mean you will receive a 25% penalty. You will have 3 days from the date the homework is due to turn in a late homework which will result in a 25% penalty. After 3 days, the homework assignment will receive no credit.
- Please refer to the assignment descriptions located on the course web site for specific information related to submission.
- You MAY NOT collaborate with anyone for the homework assignments. Each assignment must be done and written by each student individually. If an assignment description specifically states to work as a team, this would be the only exception.

- You may not use the Internet to answer homework assignments.
- The instructor and/or TA has the right to ask a student to explain how they obtained the solutions to any homework assignments. If a student cannot demonstrate authorship of a homework assignment solution, this would be a violation of Academic Integrity policy.

****Do not fall behind in the reading assignments and it is strongly advised to begin the homework assignment as soon as possible. Homework assignments and the project require dedicated time by the student.****

Project: There will be a semester long project. The project will include analysis of requirements, designing and developing a database, building an application with a user interface that accesses the database using Python. Basic programming skills are needed for the project.

- The project will have multiple phases with each phase depending upon earlier phases. Each phase will require a report be submitted on a given date that may include a written description, diagrams and source code.
- The final phase will include a full report, source code, diagrams, etc. You may also be required to give a short oral presentation of your project.
- The project phase reports and the final report are due on the due date at 11:00 pm.
- Starting at 11:01 pm, the project report (whether a phase or final) will be considered late which will mean you will receive a 25% penalty. You will have 3 days from the date the project phase/final is due to submit it receiving a 25% penalty. After 3 days, the project phase/final will receive no credit.
- The course web site will provide a full description of the project within the first two weeks of classes.
- You MAY NOT collaborate with anyone for the project. Each phase of the project must be designed, developed, coded and written by each student individually.
- The instructor and/or TA has the right to ask a student to explain how they obtained the solutions to any phase of the project. If a student cannot demonstrate authorship of the project, this would be a violation of Academic Integrity policy.

Exams: There will be a midterm examination and a comprehensive final examination. See below for dates and times. All exams are closed-book and closed-notes. Exams will be given only at the scheduled times. No make-up exams are permitted except in circumstances described by the UMBC policy.

The final exam schedule is available on the UMBC web site at:

[Final Exam Schedule](#)

Communication: Please seek help *sooner* verses later.

If there is a course policy question, start with the [course web site](#).

Use the instructor and/or TA office hours and email to ask questions.

In addition, we will be using [Slack](#). Course announcements, assignments and project information will be posted on Slack. You may wish to use the discussion area to post questions or discuss course related topics. However, do not request or post solutions to homework assignments on Slack both violate the UMBC Academic Integrity policy. If you are unsure if your post does violate this policy, send an email to the instructor or TA instead.

Grading Policy: Grades will be posted on Blackboard. The final grade for the course will be based on the following weights:

Homework Assignments	15%
Project	35%
Midterm	25%
Final	25%

Total:	100%
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Final letter grades will be determined as follows:

Grade	Score
A	89.5% or better
B	79.5% or better
C	69.5% or better
D	59.5% or better
F	below 59.5

Academic Honesty: By enrolling in this course, each student assumes the responsibilities of an active participant in UMBC's scholarly community in which everyone's academic work and behavior are held to the highest standards of honesty. Cheating, fabrication, plagiarism, and helping others to commit these acts are all forms of dishonesty and academic misconduct and they are wrong. Academic misconduct could result in disciplinary action that may include, but is not limited to, suspension or dismissal.

It is the student's responsibility to read all UMBC policies and guidelines pertaining to academic

integrity, academic conduct, and academic misconduct, including, but no limited to:

The UMBC Student Handbook

http://www.umbc.edu/undergrad_ed/ai/students.html

http://www.umbc.edu/undergrad_ed/ai/documents/ACC2011.pdf

http://www.umbc.edu/gradschool/essentials/proc_misconduct.html

Bottom line, there is no tolerance for academic dishonesty in this course.

ADA Compliance: We recognize that some of you may have disabilities that require special attention from the instructional staff. Please make us aware of them at your earliest so that UMBC can make suitable arrangements.

Important Dates: (See the [UMBC calendar](#) to confirm UMBC related deadlines.)

First Day of Classes	Jan 29
Add Deadline	Feb 9
Drop Deadline (without W)	Feb 9
Midterm	Mar 14
Drop Deadline (with W)	Apr 9
Project Deadline	See schedule
Last Day of Classes	May 15
Final Section 01	Wed May 23 1:00-3:00 PM
Final Section 02	Fri May 18 1:00-3:00 PM