Syllabus

Instructor
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Class website: http://www.csee.umbc.edu/~kalpakis/Courses/461-sp21/
Office Hours: Tuesday and Thursday, 2:30pm-3:30pm, and by appointment.

Meeting Time and Place
Tuesday and Thursday 10:00am-11:15am (section 1), Online, Synchronous.

Teaching Assistant: Information about the TA is posted on the class website.

Important Dates

• Midterm Exam, Tuesday, March 23, 10:00am, 75 mins.

• Last class, Tuesday, May 11.

• Final Exam, Thursday, May 18, 10:00am, 120 mins.

Prerequisites CMSC–341, or permission of the instructor.


List of Topics (tentative).

• Entity–Relationship Model
• Relational Model
• SQL
• Normalization
• Design Methodology
• Storage and File Structures
• Indexing and Hashing
• Query Processing
• Transactions
• Security
• Concurrency Control and Recovery
• Alternatives (NoSQL, etc)
• Special topics (TBA)

Course objectives:
Databases touch all aspects of our everyday lives. Database technologies enable us to manage vast and diverse amounts of data and information efficiently, and consequently are an indispensable component in the toolbox of every Computer Scientist. In this course, each student will (a) learn the fundamental concepts of database management, including database design, models and languages, and system–implementation techniques, and (b) develop skills to apply those concepts in practical data management applications.

Required Work
Required work consists of (1) taking the midterm exam and final exam, (2) homework assignments, and (3) projects. Further, you are expected to actively participate in class discussions. Homework assignments will help you master the fundamental concepts of database systems, while the project assignment will help you in developing skills to apply these concepts in practical data management applications. The exams will be yet another opportunity to receive feedback with respect to your accomplishment of the course objectives.

Assignments
There will be at least four homework assignments. Homework assignments involve design, analysis, and software development and will need to be completed in a short period of time, usually in about a week.

There will also be 1-3 short project assignments and a semester long project assignment.

The semester long project will have a design, analysis, and development component. Basic programming skills using the Python 3 (version 3.7 or later) programming language are needed in the project. The project may have multiple phases, with later phases depending on earlier phases. Phases are partitioned into milestones, with each milestone having a due date and several deliverables. At the due date of each milestone, you will be submitting a project progress report, any software developed, and any other specified deliverables; further, you may be asked for a demonstration of your achievements in an oral presentation. Details about each phase and milestone will be provided within the first couple of weeks of classes.

Ground Rules for Assignments
• Assignment details, due dates, etc will be posted at the class homepage. Students are strongly advised to check the class homepage on a regular basis. Failure to do so is not an acceptable excuse for missing an assignment or for not adhering to the assignment’s instructions.

• You may develop the programs, if any, for your assignments using the computers available to you at UMBC, or any other computer available to you. However, no matter what computer you use to develop your programs, you must make sure that your programs can run successfully on a Virtual Machine (VirtualBox) running the latest Ubuntu Linux operating system.

• Each assignment should be submitted electronically according to the assignment’s submission instructions by its due date to be considered for all of its allocated points.
• Each assignment also has a **deadline** which is always 72 hours past its due date. Tardy assignments submitted by their deadline are subject to a **0.5% per tardiness hour penalty** of the assignment’s allocated points. Assignments past their deadline will not be accepted (unless University policy provides otherwise).

• In submitting an assignment, students must adhere to the submission instructions specified by that assignment.

• Submitting **corrupted files** (that can not be opened, accessed, or reviewed) will result in 0 score for that assignment.

• The written part of each assignment must be typed using a word–processor of your choice (you may include hand–written mathematical formulas and/or diagrams as images in your documents). No matter how you prepare the written part of your assignment, it must submitted in the Adobe **PDF format. No other formats are going to be accepted**.

• No collaboration. Unless otherwise specified, each assignment is to be done and written individually by each student. Students should not collaborate on any assignment. The only exception would be for assignments for explicitly designated as team assignments, where team members are expected to collaborate in completing such an assignment.

• Students may be asked to come in and explain their solution(s) to an assignment to the instructor(s) and/or TA(s). Failure to satisfactory demonstrate authorship of a solution is a violation of Academic Integrity policy.

Students are strongly advised to keep up with the assignments and other coursework. Homework and project assignments do demand the amount of time allocated to them.

**Exams**

There will be one midterm exam and a comprehensive final exam. All the exams will take place online, will be available for a limited period of time, and will be open–book and open–notes. You may start an exam any time during its availability period; upon starting, you will be given 75 and 120 minutes to complete the midterm and final exams respectively. Detailed instructions about each exam will be provided a week ahead of time. Make–up exams are possible only under University Policy. You should make prior arrangements with the instructor if you expect to miss an exam.

**Communication**

Students are strongly advised to check the class homepage, and the course Blackboard area [http://blackboard.umbc.edu](http://blackboard.umbc.edu) on a regular basis for news, announcements, and assignments. Failure to do so is not an acceptable excuse for missing an assignment or announcement.

Students are welcome to use the course Blackboard area to discuss topic matters. However, student’s are advised not to solicit or post solutions to any assignment or otherwise violate Academic Integrity policy.

**Grading Policy**

The course grades will be determined as follows. For each course activity in Table 1, each student will receive an activity score, which will be the average of the student’s scores on the assignments for that activity. An activity score is a number in the range 0…100. A term score will be computed by taking the weighted sum of the activity scores, using the relative
Table 1: Course activities and their relative weights. Also shown necessary (but not sufficient) scores for each activity in order to pass the course.

weights given in Table 1. The instructor will convert term scores into letter grades by using the following mapping:

\[ [90, 100] \Rightarrow A, [80, 90) \Rightarrow B, [70, 80) \Rightarrow C, [60, 70) \Rightarrow D, [60, 100] \Rightarrow P, [0, 60) \Rightarrow F. \]

Moreover, Table 1 specifies necessary, but not sufficient, scores to pass the course. Incomplete grades will issued only under those extreme situations described by University Policy for granting incompletes. Failure to complete assignments on time is not a sufficient reason for an incomplete.

**Academic Conduct Policy**

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 academic dishonesty, and they are wrong. Academic misconduct could result in disciplinary action that may include, but is not limited to, suspension or dismissal. For further details, please refer to the UMBC Academic Conduct policies and resources for students at [https://tinyurl.com/yxelmxqz](https://tinyurl.com/yxelmxqz).

**UMBC Policies and Resources for Students during COVID–19.**

Please refer to the policies and resources during COVID-19 at [https://tinyurl.com/y5gyp9hr](https://tinyurl.com/y5gyp9hr)

**UMBC Equity and Inclusion Policies and Resources**

Please refer to the Equity and Inclusion Policies and Resources at [https://tinyurl.com/y3695g27](https://tinyurl.com/y3695g27) regarding

- Accessibility and Disability Accommodations, Guidance and Resources
- Sexual Assault, Sexual Harassment, Gender Based Violence and Discrimination
- Pregnancy
- Religious Observances & Accommodations
- Hate, Bias, Discrimination and Harassment

maintained by the UMBC Office of Equity and Inclusion at [https://oei.umbc.edu/](https://oei.umbc.edu/).