Subject: CSCI     Number:  403
Course Title: Database Management
Semester/year: Spring 2016

Instructor or Coordinator: Christopher Painter-Wakefield

Contact information:

   office: Brown Building (BB) 280I
   phone: 303-273-3717
   email: cpainter@mines.edu

Office hours: TTh 1-3pm, by appointment, or whenever my office door is open

Class meeting days/times: MWF 2:00-2:50
Class meeting location: Brown W210

Web Page/Blackboard link (if applicable):

   Course Website: http://eecs.mines.edu/Courses/csci403/
   Blackboard: https://blackboard.mines.edu/
   Piazza: https://piazza.com/mines/spring2016/csci403

Instructional activity:  3 hours lecture  0 hours lab  3 semester hours

Course designation: ___ Common Core   ___ Distributed Science or Engineering
   X  Major requirement   ___ Elective   ___ Other (please describe ______________)

Course description from Bulletin:

Design and evaluation of information storage and retrieval systems, including defining and building a database and producing the necessary queries for access to the stored information. Relational database management systems, structured query language, and data storage facilities. Applications of data structures such as lists, inverted lists and trees. System security, maintenance, recovery and definition. Interfacing host languages to database systems and object-relational mapping tools. NoSQL databases and distributed databases. Prerequisite: CSCI262 with a grade of C- or higher.

Textbook and/or other requirement materials:


Student learning outcomes: At the conclusion of the class students will be able to:

1. Construct a data model using the Entity-Relationship model.
2. Design a relational database schema implementing a data model, including tables, indexes, and constraints; analyze functional dependencies and normalize a relational database schema.
3. Understand and explain basic relational algebra operations and manipulations.
4. Construct retrieval and update queries in SQL; apply transaction control for complex updates; tune queries for performance.
5. Build applications using a relational database in Python or Java.
6. Understand and apply basic concepts in “big data” processing; construct and query NoSQL database systems.

Brief list of topics covered:

1. Entity-Relationship models and diagrams
2. The relational database model
3. Relational algebra
4. SQL and DDL
5. SQL database interfaces in Java and Python
6. NoSQL

Policy on academic integrity/misconduct: The Colorado School of Mines affirms the principle that all individuals associated with the Mines academic community have a responsibility for establishing, maintaining an fostering an understanding and appreciation for academic integrity. In broad terms, this implies protecting the environment of mutual trust within which scholarly exchange occurs, supporting the ability of the faculty to fairly and effectively evaluate every student’s academic achievements, and giving credence to the university’s educational mission, its scholarly objectives and the substance of the degrees it awards. The protection of academic integrity requires there to be clear and consistent standards, as well as confrontation and sanctions when individuals violate those standards. The Colorado School of Mines desires an environment free of any and all forms of academic misconduct and expects students to act with integrity at all times.

Academic misconduct is the intentional act of fraud, in which an individual seeks to claim credit for the work and efforts of another without authorization, or uses unauthorized materials or fabricated information in any academic exercise. Student Academic Misconduct arises when a student violates the principle of academic integrity. Such behavior erodes mutual trust, distorts the fair evaluation of academic achievements, violates the ethical code of behavior upon which education and scholarship rest, and undermines the credibility of the university. Because of the serious institutional and individual ramifications, student misconduct arising from violations of academic integrity is not tolerated at Mines. If a student is found to have engaged in such misconduct sanctions such as change of a grade, loss of institutional privileges, or academic suspension or dismissal may be imposed.

The complete policy is online.

Collaboration Policy for Programming Projects in EECS Courses:
The following policy exists for all CS courses in the EECS department. This policy is a minimum standard; your instructor may decide to augment this policy.
1. If the project is an individual effort project, you are not allowed to give code you have developed to another student or use code provided by another student. If the project is a group project, you are only allowed to share code with your group members.
2. You are encouraged to discuss programming projects with other students in the class, as long as the following rules are followed:
   a. You view another student’s code only for the purpose of offering/receiving debugging assistance. Students can only give advice on what problems to look for; they cannot debug your code for you. All changes to your code must be made by you.
   b. Your discussion is subject to the empty hands policy, which means you leave the discussion without any record [electronic, mechanical or otherwise] of the discussion.
3. Any material from any outside source such as books, projects, and in particular, from the Web, should be properly referenced and should only be used if specifically allowed for the assignment.
4. If you are aware of students violating this policy, you are encouraged to inform the professor of the course. Violating this policy will be treated as an academic misconduct for all students involved. See the Student Handbook for details on academic dishonesty.
Instructor’s Addendum:
As an addendum to this policy, you are required to submit a README file with every project. The README should list every person (other than the instructor or a TA) who assisted you in some way on the project. The README is also the place to give appropriate credit to any outside source that contributed to your submission.

Grading Procedures: There will be a number of short projects in this course which will contribute to the majority of your grade. There will be one midterm exam; there will be no final exam.

Grading will be done on an absolute, but adjustable scale. This means that there is no curve. Anyone earning 90% or more of the total number of points available will receive a grade of A; 80% or higher a B, etc. This scale may go down, but it will not go up.

All grades will be posted in Blackboard.

- Projects: 75%
- Midterm: 25%

Coursework Return Policy: Projects and exams will be graded and returned as quickly as possible, generally within two weeks.

Absence Policy: Please see the Mines policy on absences at http://inside.mines.edu/Student-Absences

Homework: Late work is strongly discouraged. All work will be accepted within 4 working days after the deadline (weekend and holiday days do not count in the 4 days). Students will lose 10 percentage points per day late. After 4 days, the work will not be accepted at all.