



**Subject: CSCI Number: 403**

**Course Title: Database Management**

**Semester/year: Spring 2018**

**Instructor:** Christopher Painter-Wakefield

**Contact information:**

**office:** Brown Building (BB) 280I

**phone:** 303-273-3717

**email:** cpainter@mines.edu

**Office hours:**

Tuesdays and Thursdays 1-3pm, or by appointment, or whenever my office door is open

**Class meeting days/times:** MWF 11:00-11:50

**Class meeting location:** Berthoud 108

**Web Page/Blackboard link (if applicable):**

**Course Website:** <https://cs.mines.edu/Courses/csci403/spring2018>

**Canvas:** <https://elearning.mines.edu/login/saml>

**Piazza:** <https://piazza.com/mines/spring2018/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:**

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. Interfacing host languages to database systems. NoSQL databases. Prerequisite: CSCI262 with a grade of C- or higher.

**Textbook and/or other requirement materials:**

**Required text:** *Fundamentals of Database Systems* (7<sup>th</sup> Edition) by Elmasri & Navathe

**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.

**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

**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%

**Late Policy:** Late work is *strongly* discouraged.

**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>

**Learning Environment:** Below you can find some "official" language from Mines on similar topics, but I also want to share my own views regarding the learning environment as it relates to my course, both in and out of the classroom.

Fundamentally, I expect and require respect in this course for yourself, your classmates, and your instructor and TAs.

- Respect for yourself includes taking care of yourself physically and mentally and advocating for an environment that facilitates learning for you.
- Respect for your classmates includes recognizing and appreciating the diversity of backgrounds and experiences of your classmates and making it your interest to foster a learning environment for everyone. Some of your classmates may already be expert programmers, while others may have only just begun to learn; all are welcome.
- Respect for your instructors (as well as your classmates) includes not participating in disruptive or distracting behavior: talking, playing games, or web surfing during lecture, for instance, make it difficult for others to focus on the reason we are all here.
- Respect must be mutual to be effective; we (your instructors) and your TAs will be held to the same standards of respect.

It's important to recognize that the rigorous requirements of studying at Mines can cause stress, which sometimes results in distressed or disruptive behavior. If you are experiencing issues, or believe that one of your partners or teammates is, please SPEAK UP. Feel free to come talk to your instructor, or visit <http://studentlife.mines.edu/Student-Life-Care>. For serious violations of school policies, also see <http://speakup.mines.edu/>.

**Discrimination and Harassment:** This course and all learning opportunities at Mines require a safe environment for everyone to be productive, develop professional practices, and to be able to share and learn without fear of discrimination or harassment. Discrimination or harassment of any type will not be tolerated. Sometimes harassment is unintentional, but regardless of intent the instructor will address any language or behaviors that might discriminate, stereotype, or promote harassment. If you witness discrimination or harassment of others, please bring it to the attention of Mines faculty so it can be addressed immediately.

Title IX is a federal law that protects individuals from discrimination based on sex and gender in educational programs or activities. Mines takes its Title IX obligations seriously and is committed to providing a campus community free from gender-based discrimination. Gender-based discrimination, including sexual harassment, sexual violence, stalking, and domestic violence, is prohibited within the Mines campus community. If these issues have impacted you or someone you know, you can find appropriate resources here: <http://inside.mines.edu/POGO-Title-IX>. You can also contact the Mines Title IX Coordinator, Karin Ranta-Curran, at 303.384.2558 or [krcurran@mines.edu](mailto:krcurran@mines.edu) for more information.

**Disability Accommodations:** The Colorado School of Mines is committed to ensuring the full participation of all students in its programs, including students with disabilities. If you are registered with Disability Support Services (DSS) and I (your instructor) have received your letter of accommodations, please contact me at your earliest convenience so we can discuss your needs in this course. For questions or other inquiries regarding disabilities, I encourage you to visit <http://disabilities.mines.edu> for more information.

**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 and 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 CS Courses:**

The following policy exists for all CS courses. 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.

All issues of misconduct are reported to the Dean of Students.

**Instructor's Addendum:**

As an addendum to this policy, you are required to submit a README file with every project (except as noted). 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.