

**CS 5300**  
**Database Systems**

Instructor: A. R. Hurson                      hurson@mst.edu  
Office: 128 EECH Building  
Office Hours: T, R: 11:00-12:00  
Text: Fundamentals of Database Systems 7<sup>th</sup> Edition (Elmasri and Navathe)

**Outline:**

1. Introduction
2. Relational Algebra
  - a) Traditional Set Operators
  - b) Extended Relational Operators
3. SQL Language
  - a) Data Definition Language
  - b) Data Manipulation Language
  - c) SQL Queries
  - d) Views
4. Performance Measure
  - a) Basic Operations
  - b) Query Optimization
5. Transaction Management
  - a) Concurrency Control
  - b) Recovery
6. Access Control and Data Security
7. Beyond Centralized Databases
  - a) Distributed Databases
  - b) Multidatabases
  - c) Mobile Databases
- \* Administrative (no make up exam)

|                            |     |
|----------------------------|-----|
| 5 Homework assignments     | 10% |
| 2 Projects (mandatory)     | 20% |
| Periodic Exams and quizzes | 40% |
| Final Exam (comprehensive) | 30% |

**Attendance**

Class attendance is highly recommended

## Makeup examinations & Extensions

There will be no makeup exams/quizzes (except for documented medical reason and highly unusual unexpected events).

## Exams

There will be one exam for each course module and one comprehensive final exam during final exams week.

## Submission Guidelines

Hardcopy of homework assignments and project(s) are collected on due date at the beginning of the class,

It is encouraged to work as a group (at most two people per group) on homework assignments/project (grouping is fixed throughout the semester).

## Tentative course schedule CS5300

| Major Topic                              | Related Text Chapter | Class notes            | Date         |
|--|----------------------|------------------------|--------------|
| <b>Introduction</b>                      | Chapter 2            | Module 1, page 1-33    | August 22    |
|  |                      | Module 1, page 34-58   | August 24    |
|  |                      | Module 1, page 59-81   | August 29    |
| <b>Test Module 1, Relational Algebra</b> | Chapter 8            | Module 2, page 1-20    | August 31    |
|  |                      | Module 2, page 20-48   | September 5  |
| <b>Test Module 2, SQL</b>                | Chapters 6 and 7     | Module 3, page 1-23    | September 7  |
| Data Definition Language                 |                      | Module 3, page 24-52   | September 12 |
| Data Manipulation Language               |                      | Module 3, page 53-85   | September 14 |
| SQL queries                              |                      | Module 3, page 86-111  | September 19 |
|  |                      | Module 3, page 112-144 | September 21 |
| <b>Test Module 3, Views</b>              | Chapter 7            | Module 4, page 1-21    | September 26 |
|  |                      | Module 4, page 22-47   | September 28 |
| <b>Test Module 4, Query Processing</b>   | Chapters 18 and 19   | Module 5, page 1-27    | October 3    |
| <b>Query Optimization</b>                |                      | Module 5, page 28-61   | October 5    |
|  |                      | Module 5, page 62-87   | October 10   |
|  |                      | Module 5, page 88-124  | October 12   |
| <b>Test Module 5, Transaction</b>        | Chapters 20 and 21   | Module 6, page 1-23    | October 17   |
| Processing and concurrency               |                      | Module 6, page 24-51   | October 19   |
| control                                  |                      | Module 6, page 52-83   | October 24   |
|  |                      | Module 6, page 84-110  | October 26   |
|  |                      | Module 6, page 111-129 | October 31   |
|  |                      | Module 6, page 130-139 | November 2   |
| <b>Test Module 6, Recovery</b>           | Chapter 22           | Module 7, page 1-24    | November 7   |
|  |                      | Module 7, page 25-50   | November 9   |
|  |                      | Module 7, page 63-87   | November 14  |
| <b>Test Module 7, Security</b>           | Chapter 30           | Module 8, page 1-21    | November 16  |
| No class, Thanksgiving                   |                      |                        | November 21  |
| No class, Thanksgiving                   |                      |                        | November 23  |
|  |                      | Module 8, page 22-63   | November 28  |
|  |                      | Module 8, page 64-91   | November 30  |
| <b>Test Module 8, Advanced topics</b>    | Chapter 23           | Module 9, page 1-36    | December 5   |
|  |                      | Module 9, page 37-74   | December 7   |

- **Title IX**

Missouri University of Science and Technology is committed to the safety and well-being of all members of its community. US Federal Law Title IX states that no member of the university community shall, on the basis of sex, be excluded from participation in, or be denied benefits of, or be subjected to discrimination under any education program or activity. Furthermore, in accordance with Title IX guidelines from the US Office of Civil Rights, Missouri S&T requires that all faculty and staff members report, to the Missouri S&T Title IX Coordinator, any notice of sexual harassment, abuse, and/or violence (including personal relational abuse, relational/domestic violence, and stalking) disclosed through communication including but not limited to direct conversation, email, social media, classroom papers and homework exercises.

Missouri S&T's Title IX Coordinator is interim chief diversity officer Neil Outar. Contact him ([naoutar@mst.edu](mailto:naoutar@mst.edu); (573) 341-6038; Temporary Facility A-1200 N. Pine Street) to report Title IX violations. To learn more about Title IX resources and reporting options (confidential and non-confidential) available to Missouri S&T students, staff, and faculty, please visit <http://titleix.mst.edu>.

- **Disabilities**

If you have a documented disability and anticipate needing accommodations in this course, you are strongly encouraged to meet with the instructor as early as possible in the semester. You will need to request that the [Disability Support Services](#) staff send a letter to the instructor verifying your disability and specifying the accommodation you will need before the instructor can arrange your accommodation. Disability Support Services is located in 203 Norwood Hall, their phone number is 573-341-6655, and their E-mail is [dss@mst.edu](mailto:dss@mst.edu). You can also initiate the accommodation process at <https://mineraccess.mst.edu>

- **Student Honor Code and Academic Integrity**

Every student enrolled in this course is expected to be familiar with both the [Student Honor Code](#) and [Missouri S&T's Student Academic Regulations](#), including the section on *Conduct of Students* which on page 23 of the June 2016 revision, defines several forms of *Academic Dishonesty* such as *cheating*, *plagiarism*, and *sabotage*. Incidences of Academic Dishonesty will typically result in zero grades for the respective course components, notification of the student's advisor, the student's department chair, and the campus undergraduate studies office, and further academic sanctions may be imposed as well in accordance with the regulations. Note that those who allow others to copy their work are just as guilty of plagiarism and will be treated in the same manner.

- **S&Tconnect:**

The purpose of the S&Tconnect Early Alert system (see the S&Tconnect tab in Canvas) is to improve the overall academic success of students by improving communication among students, instructors and advisors; reducing the time required for students to be informed of

their academic status; and informing students of actions necessary by them in order to meet the academic requirements in their courses.

- **Classroom Egress Maps:**

Please familiarize yourself with the classroom egress maps posted on-line at: <http://registrar.mst.edu/links/egress/>.

- **The Burns & McDonnell Student Success Center**

The Student Success Center is a centralized location designed for students to visit and feel comfortable about utilizing the campus resources available. The Student Success Center was developed as a campus wide initiative to foster a sense of responsibility and self-directedness to all S&T students by providing peer mentors, caring staff, and approachable faculty and administrators who are student centered and supportive of student success. Visit the B&MSSC at 198 Toomey Hall; phone: 573-341-7596; E-mail: [success@mst.edu](mailto:success@mst.edu); facebook: <https://www.facebook.com/SandTssc>; web: <https://studentsuccess.mst.edu/>