

I ILLINOIS

School of Information Sciences

IS 455: Database Design and Prototyping
IS455
Fall 2026
29 Psychology Building
Tuesday 10:00am-12:50pm
Course meets 1 time per week for 2:50 minutes

Note: this syllabus may be obtained in alternative formats upon request. Please contact the instructor.

Instructor Information

Instructor

Rachel Adler (she/her/hers)
Office: 614 E. Daniel St. Room 4133
Office Hours: Tuesdays 1pm or by appointment
Email: radler@illinois.edu
Phone: 217-244-4192 (*Email is preferred*)

Course Information

Course Description

The course provides students with both theoretical and practical training in good database design. By the end of the course students will create a conceptual data model using entity-relationship diagrams, understand the importance of referential integrity and how to enforce data integrity constraints when creating a database. Students will be proficient in writing basic queries in the structured query language (SQL) and have a general understanding of relational database theory including normalization.

Pre- and Co-requisites

None

Credit hours

3

Student Learning Objectives or Outcomes

At the conclusion of this course, you will:

- have a specific understanding of the relational database model
- be able to write basic SQL queries
- be able to implement a relational database using SQL commands
- be able to model database requirements using ER diagrams
- be able to map an ER diagram into a relational schema
- be able to use normalization and denormalization
- get familiar with various database management systems, including MySQL and MongoDB

Course Context

This course meets a number of learning outcomes connected to program objectives for the BS/IS program, which in turn connect to larger iSchool and University of Illinois learning goals.

Program Learning Outcomes

- Apply foundational concepts, theories, and principles to problems of information organization and access.
- Educate students for known, emerging, and currently unforeseeable careers in information sciences.
- Prepare interested students for graduate study in information sciences and related fields.

iSchool Goal

This course meets the following goal:

- Maintain global leadership in education for the information professions

University of Illinois Campus-Wide Learning Goals

This course meets the following goals

1. *Intellectual Reasoning and Knowledge*
2. *Creative Inquiry and Discovery*

Course materials

Course materials, such as articles, lecture notes, videos will be posted by the instructor on the course website.

Required Textbooks: (1) Database Systems: A Practical Approach to Design, Implementation, and Management Author: Thomas Connelly and Carolyn Begg, 6th edition

Optional Textbooks: (1) The Manga Guide to Databases by Mana Takahashi Illustrated Shoko Azuma (2) A Practical Introduction to Databases by Christopher Painter-Wakefield (Free online textbook - we will use particularly for ER modeling)

Week-by-Week Topic and Assignment Schedule

Schedule (subject to revision)

Week	Topics
1	Introduction
2	Database Environment / Architecture
3	SQL Basics
4	SQL Continued
5	Relational Model
6	Views and More
7	DBMS Lifecycle/Fact-Finding Techniques
8	Midterm Exam / Project Planning
9	ER Modeling
10	ER Modeling, continued
11	Converting ERD to Relational Model / Normalization
12	Advanced Normalization and Denormalization
13	Connect from Web Application
14	Database Issues & Final Project Presentations
15	NoSQL DB
	Final Project Report Due

Assignments and Methods of Assessment

All assignments are required for all students.

Assignments – 25%

Quizzes – 15%

Midterm Exam – 25%

Final Project– 25%

Attendance/Participation – 10%

Use of Artificial Intelligence Policy

Predictive writing technologies (like ChatGPT, Google Translate, and Grammarly) can be valuable writing tools in many contexts, when used effectively. If you use predictive technologies in this class, use them ethically by disclosing how you used them. It should not be used to complete assignments. Come to me with questions!

Late Assignment Policy

Late or incomplete assignments will not be given full credit unless the student has contacted the instructor prior to the due date of the assignment (or in the case of emergencies, as soon as practicable).

Incomplete grades

An exceptional request for an incomplete grade is most often granted to students encountering a medical emergency or other extraordinary circumstances beyond their control. Students must request an incomplete grade from the instructor. The instructor and student will agree on a due date for completion of coursework. The student must [submit an Incomplete Form](#) signed by the student, the instructor, and the student's academic advisor to the front office. Please [see the Student Code policy on Incomplete grades](#) for full details.

Grading Scale

Grade	Percentage
A	94–100
A-	90–93
B+	87–89
B	83–86
B-	80–82
C+	77–79
C	73–76
C-	70–72
D+	67–69
D	63–66
D-	60–62
F	59 and below

Course Policies

Attendance/ Participation Policy

The iSchool expects students to attend all classes except in cases of emergency. For more information, see [the Student Code on Attendance](#).

If you have an emergency, communicate with the instructor as early as possible. Students who miss more than two classes—or who regularly arrive late or leave early—will not receive the full participation grade.

Disruptive behavior

Behavior that persistently or grossly interferes with classroom activities is considered disruptive behavior and may be subject to disciplinary action. Such behavior inhibits other students' ability to learn and an instructor's ability to teach. A student responsible for disruptive behavior may be required to leave class pending discussion and resolution of the problem and may be reported to the [Office for Student Conflict Resolution](#) (email: conflictresolution@illinois.edu; phone: (217) 333– 3680) for disciplinary action.

Academic Integrity

The iSchool has the responsibility for maintaining academic integrity so as to protect the quality of education and research in our school and to protect those who depend on our integrity. Consequences of academic integrity infractions may be serious, ranging from a written warning to a failing grade for the course or dismissal from the University. For more information see, the [student code for academic integrity requirements](#).

Please review and reflect on [the academic integrity policy of the University of Illinois](#), to which we subscribe. By turning in materials for review, you certify that all work presented is your own and has been done by you independently, or as a member of a designated group for group assignments.

If, in the course of your writing, you use the words or ideas of another writer, proper acknowledgement must be given. Not to do so is to commit plagiarism, a form of academic dishonesty or plagiarism. Please be aware that the consequences for plagiarism or other forms of academic dishonesty will be severe. Students who violate university standards of academic integrity are subject to disciplinary action, including a reduced grade, failure in the course, and suspension or dismissal from the University.

Student Resources

Statement of Inclusion

As the state's premier public university, the University of Illinois at Urbana-Champaign's core mission is to serve the interests of the diverse people of the state of Illinois and beyond. The institution thus values inclusion and a pluralistic learning and research environment, one which we respect the varied perspectives and lived experiences of a diverse community and global workforce. We support diversity of worldviews, histories, and cultural knowledge across a range of social groups including race, ethnicity, gender identity, sexual orientation, abilities, economic class, religion, and their intersections. For further information, see [the Academic Senate Resolution on Diversity Values](#).

Religious Observances

In keeping with our Statement of Inclusion and Illinois law, the University is required to reasonably accommodate its students' religious beliefs, observances, and practices in regard to admissions, class attendance, and the scheduling of examinations and work requirements. Other accommodations may be available. [Request an accommodation for religious observance](#).

Accessibility Statement

To ensure disability-related concerns are properly addressed from the beginning of the semester, I request that students with disabilities who require assistance to participate in this class contact me as soon as possible to discuss your needs and any concerns you may have. The University of Illinois may be able to provide additional resources to assist you in your studies through the office of Disability Resources and Educational Services (DRES). This office can assist you with disability-related academic adjustments and/or auxiliary aids. Please contact them as soon as possible by visiting the office in person: 1207 S. Oak St., Champaign; visiting [the DRES website](#); calling (217) 333-4603 (V/TTY); or via e-mail: disability@illinois.edu.

Mental Health Resources

Significant stress, mood changes, excessive worry, substance/alcohol misuse or interferences in eating or sleep can have an impact on academic performance, social development, and emotional wellbeing. The University of Illinois offers a variety of confidential services including individual and group counseling, crisis intervention, psychiatric services, and specialized screenings which are covered through the Student Health Fee. If you or someone you know experiences any of the above mental health concerns, it is strongly encouraged to contact or visit any of the University's resources provided below. Getting help is a smart and courageous thing to do for yourself and for those who care about you.

- Counseling Center (217) 333-3704
- McKinley Health Center (217) 333-2700
- National Suicide Prevention Lifeline (800) 273-8255
- Rosecrance Crisis Line (217) 359-4141 (available 24/7, 365 days a year)

If you are in immediate danger, call 911.

Emergency Response Recommendations

In case of emergency, [emergency response recommendations and campus building floor plans](#) are available. I encourage you to review this website within the first 10 days of class.

Sexual Misconduct Reporting Obligation

The University of Illinois is committed to combating sexual misconduct. Faculty and staff members are required to report any instances of sexual misconduct to the University's Title IX Office. In turn, an individual with the Title IX Office will provide information about rights and options, including accommodations, support services, the campus disciplinary process, and law enforcement options.

We Care Illinois hosts [a list of designated University employees who do not have a reporting responsibility](#) and can maintain confidentiality, as counselors, confidential advisors, and medical professionals. For other information about resources and reporting refer to [We Care Illinois](#).

Library Resources

[The Information Sciences Virtual Library](#) hosts many useful library resources for students.

The iSchool Academic Support Center

The iSchool Academic Support Center offers academic success workshops; coordinates with faculty and instructors to provide support for specific courses or exams; and curates and shares academic support resources. Appointments are available online and in person in room 4020 (Academic Support Center) in the 614 E. Daniel iSchool building. For more information including hours of operation, please visit [the Academic Support Center's website](#).

The Writers Workshop

[The Writers Workshop](#) provides writing support to students, including individual consultations, workshops, and resources.

To request disability-related accommodations for our services, please contact Dr. Carolyn Wisniewski at wow@illinois.edu or call 217-333-8796.