

**CS 415: Design of Database Systems
College of Arts & Sciences Syllabus**

COURSE INFORMATION

Credit Hours: 3

Course Description: This course covers various concepts associated with design and construction of data base systems. Topics include data base architecture, relational model, relational languages (SQL), normalization theory, Entity-Relationship theory and physical data base design. Students will develop a simple data base system.

Course Prerequisites: CS-400 and CS 404

FACULTY INFORMATION

Instructor: Rachel Adler

Office Location: LWH 3047

Office Hours: Tuesdays 10am – 12:30pm and Thursdays 10am – 12:30pm or by appointment

Phone Extension: x4710 (email is the best way to reach me!)

E-mail: r-adler@niu.edu

COURSE MATERIALS

Course Website: <http://cs.niu.edu/~radler/cs415>

List of Required Texts / Materials:

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

MAJOR COURSE TOPICS

- Relational Databases
- SQL
- Entity Relationship Diagrams
- Normalization
- Distributed Database
- NoSQL Database
- Handling Big Data

COURSE OBJECTIVES / STUDENT LEARNING OUTCOMES

- Apply concepts of relational database management systems to design their own databases.
- Use SQL to create queries of intermediate and high complexity.
- Optimize design of databases by applying knowledge of ER Diagrams and normalization.
- Create applications that interface with a database.
- Critically analyze problems to determine whether the solution involves traditional or non-traditional database paradigms, such as NoSQL.
- Effectively communicate the mechanisms involved in advanced database trends, for example Big Data.

STUDENT TASKS / ASSIGNMENTS / REQUIREMENTS

Assignments:

Students will be required to complete assignments on understanding database management systems and how others use them, learning about the DB environment, using SQL to create, modify, and join tables, using a relational model, creating views, understanding the DBMS lifecycle, creating ER diagrams, normalizing and denormalizing tables, creating a web application to interact with the database, understanding methodology for database design and database issues, and using NoSQL.

Project:

Design and implement a complete database. Create a Web application to interact with your database.

Grading Policies and Formulae:

Assignments – 30%

Quizzes – 10%

Online Midterm Exam – 30%

Final Project – 30%

90-100%	A
80-89%	B
70-79%	C
60-69%	D
0-59%	F

Course Outline:

<i>Week</i>	<i>Topic</i>	<i>Readings</i>
1	Introduction	Chapter 1
2	Database Environment	Chapters 2-3
3	SQL Basics	Beginning of Chapter 6
4	SQL Continued	End of Chapter 6
5	Relational Model	Beginning of Chapters 4 and 7
6	Views	End of Chapters 4 and 7
7	Online Midterm Exam / DBMS Lifecycle/Fact-Finding Techniques	Chapters 10-11
8	ER Modeling	Chapter 12
9	Enhanced ER Modeling	Chapter 13
10	Normalization	Chapter 14
11	Advanced Normalization and Denormalization	Chapters 15 and 19
12	Methodology for Database Design Database Issues	Chapters 16-18 Chapters 20-21
13	Distributed Database Systems Connect from PHP	Chapter 24
14	NoSQL DB	
15	Big Data Frameworks	
16	Final Projects Due	

COURSE POLICIES AND STATEMENTS

Absence Policy:

As this is an online class, attendance is in the form of doing all assignments and quizzes on time. No late work is allowed.

Academic Integrity Policy:

By enrolling in this course, you are bound by the NEIU Student Code of Conduct: <http://www.neiu.edu/university-life/student-rights-and-responsibilities/student-code-conduct>. You will be informed by your instructor of any additional policy specific to your course regarding plagiarism, class disruptions, etc.

ADA Statement:

Northeastern Illinois University (NEIU) complies with the Americans with Disabilities Act (ADA) in making reasonable accommodations for qualified students with disabilities. To request accommodations, students with special needs should make arrangements with the Student Disability Services (SDS) office, located on the main campus in room D104. Contact SDS via (773) 442-4595 or <http://www.neiu.edu/university-life/student-disability-services>.

Campus Safety:

Web links to Campus Safety: Emergency Procedures and Safety Information can be found on *NEIUport* on the MyNEIU tab or as follows:
http://homepages.neiu.edu/~neiutemp/Emergency_Procedures/MainCampus/.

Assignment Policy

There will be many assignments. All work **MUST** be submitted on their given due date or a grade of zero will be assigned. **No late homework assignments will be accepted.** Please begin assignments early to ensure that you finish them on time. All grades for each assignment will be posted online on D2L at most one week after the due date. All assignments are due **Thursdays before 4:00p.m.**

Additional Academic Integrity Policy:

All assignments must be the student's own work. If you copy homework, you and the student whose homework you copied will receive a zero. Two students may not submit the same homework. If you are caught copying another student's exam, or allowing someone to copy your exam, you will fail the exam and face further academic discipline.