

Eastern Illinois University
New Course Proposal
CSM 3950, Introduction to Database Concepts

Agenda Item #17-49
Effective Spring 2018

Banner/Catalog Information (Coversheet)

1. ☒ **New Course** or ☐ **Revision of Existing Course**
2. **Course prefix and number:** CSM 3950
3. **Short title:** Database Systems
4. **Long title:** Introduction to Database Concepts
5. **Hours per week:** 3 Class 0 Lab 3 Credit
6. **Terms:** ☐ Fall ☒ Spring ☐ Summer ☐ On demand
7. **Initial term:** ☐ Fall ☒ Spring ☐ Summer Year: 2018
8. **Catalog course description:**

This course emphasizes the concepts and structures necessary for the design and implementation of database management systems. Topics include data models, data normalization, data description languages, query facilities, file organization, index organization, file security, data integrity, and reliability.

9. **Course attributes:**

General education component: None

☐ Cultural diversity ☐ Honors ☐ Writing centered ☐ Writing intensive ☐ Writing active

10. **Instructional delivery**

Type of Course:

☒ Lecture ☐ Lab ☐ Lecture/lab combined ☐ Independent study/research
☐ Internship ☐ Performance ☐ Practicum/clinical ☐ Other, specify: _____

Mode(s) of Delivery:

☒ Face to Face ☐ Online ☐ Study Abroad
☐ Hybrid, specify approximate amount of on-line and face-to-face instruction _____

11. Course(s) to be deleted from the catalog once this course is approved. None

12. **Equivalent course(s):** None

a. Are students allowed to take equivalent course(s) for credit? ☐ Yes ☐ No

13. **Prerequisite(s):** CSM 3870 Data Structures, MAT 2345 Discrete Mathematics

a. Can prerequisite be taken concurrently? ☐ Yes ☒ No

b. Minimum grade required for the prerequisite course(s)? C

c. Use Banner coding to enforce prerequisite course(s)? ☒ Yes ☐ No

d. Who may waive prerequisite(s)?

☐ No one ☒ Chair ☒ Instructor ☐ Advisor ☐ Other (specify)

14. Co-requisite(s): None

15. Enrollment restrictions

a. Degrees, colleges, majors, levels, classes which may take the course: All

b. Degrees, colleges, majors, levels, classes which may not take the course: None

16. Repeat status: ☒ May not be repeated ☐ May be repeated once with credit

17. Enter the limit, if any, on hours which may be applied to a major or minor: no limit

18. Grading methods: ☒ Standard ☐ CR/NC ☐ Audit ☐ ABC/NC

19. Special grading provisions:

☐ Grade for course will not count in a student's grade point average.

☐ Grade for course will not count in hours toward graduation.

☐ Grade for course will be removed from GPA if student already has credit for or is registered in:

☐ Credit hours for course will be removed from student's hours toward graduation if student already has credit for or is registered in: _____

20. Additional costs to students:

Supplemental Materials or Software None

Course Fee ☒ No ☐ Yes, Explain if yes _____

21. Community college transfer:

☐ A community college course may be judged equivalent.

☒ A community college may not be judged equivalent.

Note: Upper division credit (3000+) will not be granted for a community college course, even if the content is judged to be equivalent.

Rationale, Justifications, and Assurances (Part I)

1. ☒ Course is required for the major(s) of Computer Science

___ Course is required for the minor(s) of _____

___ Course is required for the certificate program(s) of _____

___ Course is used as an elective

2. **Rationale for proposal :**

Database management systems are an indispensable tool for managing information, and a course on the principles and practice of database systems is now an integral part of computer science curricula. A course in Database Systems is beneficial to the job prospects of a computer science major. Our students can discuss their knowledge in database administration, design, and tuning, as well as query optimization and knowledge of Database Management Systems, and the projects developed in this course with potential employers.

3. **Justifications for (answer N/A if not applicable)**

Similarity to other courses:

There is overlap with MIS 4200 Systems and Database Analysis, Design, and Development in topics and general concepts, but this course will focus on programming issues, solutions, and theory.

Prerequisites: CSM 3870 Data Structures which indicates that students have some sophistication in programming and knowledge of underlying structures and object oriented design.

MAT 2345 Discrete Mathematics is needed for the analysis of algorithms, proof techniques, logic, and operations on relations.

Co-requisites: None

Enrollment restrictions: None

Writing active, intensive, centered: N/A

4. **General education assurances (answer N/A if not applicable)**

General education component: N/A

Curriculum: N/A

Instruction: N/A

Assessment: N/A

5. **Online/Hybrid delivery justification & assurances (answer N/A if not applicable)**

Online or hybrid delivery justification: N/A

Instruction: N/A

Integrity: N/A

Interaction: N/A

Model Syllabus (Part II)

Please include the following information:

1. Course number and title

CSM 3950 Introduction to Database Concepts

2. Catalog description

This course emphasizes the concepts and structures necessary for the design and implementation of database management systems. Topics include data models, data normalization, data description languages, query facilities, file organization, index organization, file security, data integrity, and reliability.

3. Learning objectives.

Student will be able to:

- Understand and utilize basic database management system concepts (CT-2, CT-3, QR-3, QR-4, QR-6)
- Correctly model data (CT-2, CT-3, QR-3, QR-4)
- Correctly design and implement a database (network, relational, and hierarchical) (CT-2, CT-3, CT-5)
- Correctly utilize a database query language, such as SQL (CT-2, QR-3, QR-6)
- Understand how queries are processed (CT-2, QR-4, QR-6)
- Understand storage and indexing issues as related to databases (CT-2, CT-3, QR-4)
- Understand and address recovery and security problems as related to databases (CT-2, CT-3, CT-5, QR-4)

4. Course materials.

Database Management Systems, Third Edition, Raghu Tamakrishnan and Johannes Gehrke, McGraw-Hill

5. Weekly outline of content.

Week	Chapter	Topic
1	1	Overview of Database Systems, Introduction to Database Design
2	2	Database Design, the Entity-Relationship (ER) Data Model
3	3	The Relational Model: Constraints, SQL
4	3	The Relational Model: ER to Relational, Views
5	4	Relational Algebra and Calculus
6	5	SQL: Queries, Constraints, Triggers
7	5	Nested Queries, Set-Comparison and Aggregate Operators, Designing Active Databases
8	7	Internet Applications, HTTP, HTML, XML, DTDs
9	8	Storage and Indexing, Performance Tuning
10	12	Query Evaluation, Optimization
11	16	Transaction Management, Concurrency
12	17, 18	Concurrency Control, Crash Recovery
13	19	Schema, Refinement, Normalization: Redundancy, Dependencies
14	20	Physical Database Design and Tuning
15	21	Security and Authorization
16		Final Exam

Optional or for second course: Parallel and Distributed Databases, Object-Database Systems, Data Mining

6. Assignments and evaluation, including weights for final course grade.

Homework	10%
Programming Projects	20%
Quizzes	5%
Hour Exams (2 at 20% each)	40%
Final Exam	25%

7. Grading scale.

Final grades will be given on a standard A, B, C, D, F scale:

90 – 100% A	80 – 89% B	70 – 79% C	60 – 69% D	Below 60% F
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8. Correlation of learning objectives to assignments and evaluation.

	Homework (10%)	Projects (20%)	Quizzes (5%)	Exams (40%)	Final (25%)
Understand and utilize basic database management system concepts (CT-2, CT-3, QR-3, QR-4, QR-6)	X	X	X	X	X
Correctly model data (CT-2, CT-3, QR-3, QR-4)	X	X	X	X	X
Correctly design and implement a database (network, relational, and hierarchical) (CT-2, CT-3, CT-5)	X	X	X	X	X
Correctly utilize a database query language, such as SQL (CT-2, QR-3, QR-6)	X	X	X	X	X
Understand how queries are processed (CT-2, QR-4, QR-6)	X		X	X	X
Understand storage and indexing issues as related to databases (CT-2, CT-3, QR-4)	X	X	X	X	X
Understand and address recovery and security problems as related to databases (CT-2, CT-3, CT-5, QR-4)	X	X	X	X	X

Date approved by the department or school: November 28, 2016

Date approved by the college curriculum committee: January 20, 2017

Date approved by the Honors Council (if this is an honors course):

Date approved by CAA: February 23, 2017 CGS: Not applicable