

EECS 116 INTRODUCTION TO DATA MANAGEMENT
(Elective for CpE)

- Catalog Data:** **EECS 116 Introduction to Data Management (4)** Introduction to the design of databases and the use of database management systems (DBMS) for applications. Topics include entity-relationship modeling for design, relational data model, relational algebra, relational design theory, and Structured Query Language (SQL) programming. Prerequisite: ICS 52 or Informatics 43, with a grade of C or better (for ICS or Informatics majors); either ICS23/ICSH23 or EECS114 with a grade of C or better (for Computer Engineering majors). Same as Computer Science 184. Formerly ECE146. (Design units: 1)
- Textbook:** Silberschatz, Korth and Sudarshan, *Database System Concepts*, 5th edition, McGraw Hill, 2005.
- References:**
- Coordinator:** Phillip C.-Y. Sheu
- Course Objectives:** This course provides students with an introduction to the design of databases and the use of database management systems for applications. We will cover the entity relationship (E/R) approach to database design and the relational data model, mapping E/R designs to relations, relational design theory, abstract query language such as relational algebra, and programming in SQL. Students will get exposure to how relational database management systems are used to implement a database. Time permitting; we will also consider advanced database management features such as object-oriented and object-relational database systems. This course is aimed at database design and use of database management systems in implementing database applications. It does NOT cover the implementation of database management systems which will be covered in extensive details in a graduate course EECS225.
- Course Outcomes:** Students will:
Describe the essences of data engineering and its applications to the analysis and design of engineering solutions.
Describe the steps involved in the design of database systems.
Describe the use of data engineering to interpret and utilize data.
Describe the role of data engineering for business and other applications.
Describe the application of relational algebra and relational calculus.
- Prerequisites By Topic:** Student should have knowledge of basics of computer systems; experience programming in at least one of C or C++. We assume that students are proficient in programming and in the Windows Environment.
- Lecture Topics:** Introduction to Database Management Systems
Conceptual Database Design (using E/R model)
Relational Database Model
Relational Algebra.
Programming in SQL

Relational Design Theory (normal forms, decomposition)
Object Oriented Databases, Object Relational Databases (time permits)

Class Schedule: Meets for 3 hours of lecture and 1 hour of discussion each week for 10 weeks.

Computer Usage:

Laboratory Projects:

Professional Component: Contributes toward the Computer Engineering Topics Courses and Major Design experience.

Relationship to Program Outcomes: This course relates to Program Outcomes a, b, and c as stated at: <http://undergraduate.eng.uci.edu/degreeprograms/computer/mission>

Design Content Description

Approach: Design content will focus on the following:

Database design process.

Entity/relationship model:

- a) Entity sets.
- b) Relationship sets.
- c) Constraints on entity sets.
- d) Constraints on relationship sets.
- e) Weak entity sets.
- f) Super class/subclass relationships.
- g) Aggregation.

Lectures: Assignments -50%, Lecture – 50%

Laboratory Portion: 0%

Grading Criteria:

Home work assignments:	30%
Midterm exam:	30%
Final exam:	<u>40%</u>
	100%

Estimated ABET Category Content:

Mathematics and Basic Science: 0 credit units or 0%

Engineering Science: 3 credit units or 75%

Engineering Design: 1 credit units or 25%

Prepared by: Phillip C.-Y. Sheu **Date:** July 2007

CEP Approved: Fall 2004