Course Syllabus

SIE 550 Design of Information Systems

Course Description
Cognitive and theoretical foundation for representation of knowledge in information systems and fundamental concepts necessary to design and implement information systems. Logic programming as a tool for fast design and prototyping of data models. Formal languages and formal models, conceptual modeling techniques, methods for data abstraction, object-oriented modeling and database schema design. Relational data model and database query languages, including SQL.

Prerequisites: Graduate standing or permission of instructor. Credits: 3

Slides of all lecture material will be available on a course web page.

Course Goals and Objectives
- to introduce students to formal languages and formal modeling approaches that underlie information systems, that is, theoretical foundation for representing knowledge in information systems,
- to use logic-based programming as a tool for fast prototyping and design of data structures,
- to understand conceptual modeling techniques and methods for data abstraction,
- to introduce major database models including relational and object-oriented models,
- to explore extensions of these data models for temporal and spatial data

Expected Outcomes
- Understand formal languages and formal theories
- Understand the conceptual modeling for databases
- Understand the logic of formulating possibly complex queries

Faculty Information
Professor Max J. Egenhofer
School of Computing and Information Science, Boardman Hall
max@spatial.maine.edu

Course Goals and Objectives
- Introduce students to concepts of modern database systems
- Develop an understanding of using, designing, and programming database systems
- Expose students to practical work with database systems through a series of labs

Office Hours
Office hours for this course will be announced at the beginning of the semester. Alternatively, contact me by email to arrange a time to meet.

Grading, Class Policies, and Course Expectations
Labs: 30%
Mid term: 30%
Final: 30%
Questions-of-the-day and Friday class participation: 10%
Late assignments, make-up, retake and rescheduled exams, and extra credit
A late submission of the written summary after the due date will be docked 10 percent per day and will not be accepted for credit after a week.
Incomplete work
Incomplete or insufficient work may not be made up. It merely receives a low grade.

ACADEMIC INTEGRITY: Academic dishonesty includes cheating, plagiarism and all forms of misrepresentation in academic work, and is unacceptable at The University of Maine. As indicated in the University of Maine's on-line "Student Handbook," plagiarism (the submission of another's work without appropriate attribution) and cheating are violations of The University of Maine Student Conduct Code. An instructor who has probable cause or reason to believe a student has cheated may act upon such evidence, and should report the case to the supervising faculty member or the Department Chair for appropriate action.

DISABILITIES (ADA) STATEMENT: Students with disabilities who may need services or accommodations to fully participate in this class should contact Ann Smith, Director of Disability Services in 121 East Annex, (voice) 581-2319, (TTY) 581-2325 as early as possible in the semester.

CLASS DISRUPTION: In the event of an extended disruption of normal class activities, the format for this course may be modified to enable its completion within its programmed time frame. In that event, you will be provided an addendum to the syllabus that will supersede this version.

E-Learning Approach
The lectures for Monday and Wednesday will be pre-recorded and made available through the course web site as Quicktime movies. Students can view these lectures at their own leisure throughout the week, but before Friday's live class. Each lecture will include two questions of the day, for which each student must submit the answers by Thursday 5:00pm.

The Friday class will be held in-class with the on-campus students and audio will be streamed live.

Course Topics

Week 1:
Overview, Goals, Procedures
Models of Reality

Week 2:
Labor Day
Cognitive Foundations

Week 3:
Data and Information
Formal Languages

Week 4:
Information Theory
Formal Theories

Week 5:
Formal Properties
Prolog

Week 6:
Prolog II
Models

Week 7:
Columbus Day
Information Systems

Week 8:
Database Design
Classification

Week 9:
Generalization
Aggregation and Association
mid term

Week 10:
Integrity Constraints
Object Orientation

Week 11:
Specifying Behavior
Relational Data Model

Week 12:
Relational Operators

Week 13:
SQL
NULL Values

Week 14:
Behavior under Updates
Extensions for Temporal Data

Week 15:
Extensions for Spatial Data
Similarity