



THE OHIO STATE UNIVERSITY
COLLEGE OF ENGINEERING

Advanced Spatial Databases

CIVILEN 7432

Credit Hours:

4.00 - 4.00

Course Levels:

Graduate (5000-8000 level)

Course Components:

Lecture
Lab

Course Description:

Introduction to spatial algorithms; spatial data generation; 3-D spatial modeling; spatial indexing; spatial relational operators; normalization and confirmation; and spatial applications.

Prerequisites and Co-requisites:

Prereq: 5001, 5421, 6431, or permission of instructor.

Course Goals / Objectives:

- Know how and when to generate spatial data sets
 - Write and program algorithms for managing spatial data sets
 - Build advanced mapping/GIS related spatial database systems
 - Use databases for GIS applications
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Course Topics:

- Introduction and fundamental knowledge
 - Automated Spatial Data Acquisition: Direct measuring techniques (GPS, total station based measurements); Indirect measuring techniques (mobile mapping, airborne and satellite remote sensing); Automatic spatial map feature generation
 - Spatial Object Modeling and Database Generation: 2-D Spatial object modeling; 3-D Spatial object modeling; Spatial database design and generation
 - Spatial Relations and Algebra in Mapping and GIS: Review of relational operators; Relational algebra; Application in mapping and GIS; Peano relations for raster map data; Normalization and conformation of spatial databases
 - Map Related Spatial Data Access, Quality and Applications:; Spatial indexing; Integrity constraints; Spatial topology and consistency; Distributed map related spatial databases; Octree and subsurface modeling; Spatial data mining
 - Sensors used in spatial data collection (satellite, airborne, and marine)
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Designation:

Elective

Required