



e-Learning course on Geographic Databases (Advanced)

Contact

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| Teacher: | Asst Prof, Dr. Emmanuel Stefanakis estef@hua.gr |  |
| Tutor: | Dipl. Eng., M.Sc., Kostas Patroumpas kpatro@dblab.ece.ntua.gr |  |

Goal

This course focuses on theoretical and practical issues related to the development of geographic databases. Students will learn how to design and implement advanced geographic databases using commercial database management systems.

Contents

Part I: Theoretical Issues

Module 1: Geographic Query Execution

- GIS Architectures
- Geographic Operations
- Spatial Data Structures and Indices
- Query Execution Strategies

Module 2: Geographic Databases and XML

- XML basics
- Geographic XML-based Languages (GML, SVG, and KML)
- Visualizing XML-based Geographic Data

Module 3: Commercial Systems – Oracle Spatial

- Commercial DBMSs with Spatial Capabilities
- Object-Relational Technology

- Oracle Spatial (spatial concepts, spatial data types and operations, indexing and querying spatial data, special features)

Part II: Practical Issues (Labs)

Module 4: Lab 1 – Building a Geographic Database in Oracle Spatial

- Conceptual and logical design of the database
- Physical implementation of the database
- Data entry (loading data)
- Query formulation (handling and querying data)
- Geographic data visualization using Oracle Map Viewer

Module 5: Lab 2 – Mapping Geographic Data into XML-based formats

- Exporting geographic data in GML format (in Oracle)
- Converting GML features into KML format
- Displaying KML data in Google Earth

Style

- Active knowledge acquisition.
- Asynchronous part: self-study based on online material and suggested references.
- Synchronous part: discussion of problems and labs in 3 synchronous sessions
- Access to teacher and tutor via E-Mail.
- Students' interaction via forum.
- Required software will be available at HUA server – students will have access to it through the Internet.
- Part I (theory) lasts for two weeks. Part II (labs) lasts for three weeks.
- Two lab assignments (one per lab module) due at the end of each module. Labs assignments to be executed in teams of 2-3 students (one deliverable per team).
- One on-line exam at the end of the course.
- Student workload: 90 hours, equivalent to 3 credit points

Participants

15 students from UniBw M

15 students from UWH

Organization

- Start and end of the course: Jan. 15, 2007 – Feb. 26, 2007

- Dates of the synchronous sessions:
 - Monday Jan 15, 2007: 16:30-17:30 (Portuguese time) 18:30-19:30 (Greek time): welcome and test session.
 - Monday Jan. 29, 2007: 16:30-17:30 (Portuguese time) 18:30-19:30 (Greek time): content session.
 - Monday Feb. 12, 2007: 16:30-17:30 (Portuguese time) 18:30-19:30 (Greek time): content session.
- Assignments Due:
 - 1st Lab assignment: Feb. 15, 2007 (firm)
 - 2nd Lab assignment: Feb. 23, 2007 (firm)
- Final Exam: Monday, Feb. 26, 2007: 16:30-17:30 (Portuguese time) 18:30-19:30 (Greek time)

Successful participation

- Do the lab assignments
- Pass the final exam

Course preparation

- Enroll at local teacher
- Access to e-Learning platform
- Access to reading materials, which are not provided online
- Access to software

Literature

Required:

- Online material
- Oracle Spatial 10g – User's Manual

Recommended:

- S.Shekhar and S. Chawla, 2002. Spatial Databases: A Tour. Pearson Education.
- P.Rigaux, M. Scholl, A. Voisard, 2001. Spatial Databases with Application to GIS. Morgan Kaufmann.
- SVG/GML/KML Specifications