

GGG 773-001 Interoperability of Geographic Information Systems

Instructor: Liping Di

Center for Spatial Information Science and Systems (CSISS)

George Mason University

MSN 6E1

Office Address: Commerce Building, 4087 University Drive, Suite 3100

Fairfax, VA 22032

Tel: 703-993-6114, E-mail: ldi@gmu.edu

Office Hours: Monday 2-5 pm

Spring 2015, Monday 7:20-10:00pm, Exploratory Hall 2312

Course Overview

This is an advanced course designed for students who are interested in theory, standards, and implementation of Web-based interoperable geographic information systems for on-line data and information services. Students registered to this class should have some knowledge of Geographic Information Systems and geospatial data.

Prerequisite: Either GGS 553 or GGS 754, or permission of instructor

Textbook: None

Major References: The standards and interoperability specifications discussed in this course can be found in the following websites:

1. Federal Geographic Data Committee (FGDC): <http://www.fgdc.gov>
2. International Organization for Standardization (ISO) TC 211: <http://www.isotc211.org>
3. Open Geospatial Consortium (OGC): <http://www.opengeospatial.org>

The instructor will also provide some ISO standards and specifications, which are not available through the ISO website, for discussions.

Course Work: The work of the semester will consist of readings of selected interoperability standards and specifications. Each student is required to give two presentations of standard or specification reviews, each for about twenty to thirty minutes. There is no mid-term or final exam for this course. However, students have to turn in a paper of their selected topics related to GIS interoperability and standards at the end of the semester. Grades will be determined from classroom discussions, presentations of standard reviews, and the paper.

Grading: Presentation and class discussions: 40%
Semester paper: 60%

Syllabus:

Week 1 (January 26): Introduction of the course; what is Geographic Information Systems; the definition of GIS interoperability

Week 2 (Feb 2): The needs and level of interoperability; How to make the GIS interoperable (the roles of standards); Types of Geographic Information Standards, their definitions, and roles; Who are the major players in defining federal, national, and international standards on geographic information and what is the relationships among the standards defined by different players.

Week 3 (February 11): Introduction to Federal Geographic Data Committee and their roles; Introduction to FGDC standards on geographic information.

Week 4 (February 16): Information on US national GIS standards; the InterNational Committee on Information Technology Standards (INCITS) Technical Committee L1 and their roles; The ISO TC 211 organization; The ISO 191XX series of standards.

Week 5 (February 23): Introduction to Open Geospatial Consortium, its organization, roles, and activities; OGC SP and IP programs; OGC Abstract Specifications on geographic information; OGC Implementation Specifications; The relationships between geographic information standards; The relationship between ISO standards and OGC specifications. Assign standards to students for review.

Week 6 (March 2): What is metadata? The FGDC Content Standard for Digital Geospatial Metadata; the FGDC Remote Sensing Metadata Extensions; The ISO 19115 Geographic Information—Metadata; ISO 19115-2; the new ISO 19115-1; ISO 19115-3. The relationship between those metadata standards; The ANSI adoption processes of ISO metadata standards.

Week 7 (March 9): Spring Break

Week 8 (March 16): ISO 191XX Standards on Imagery, and current ISO TC 211 projects on imagery and gridded data.

Week 9 (March 23): Presentation of standard reviews by each students and discussions.

Week 10 (March 30): Web-based interoperable Geographic Information Services; OGC Web service architecture and technology; OGC Specifications on Chainable Web Services, semantic geospatial web. Assign OGC specifications to students for review.

Week 11 (April 6): OGC Web Map Service Specification (WMS); OGC Web Coverage Service Specification (WCS); OGC Web Feature Service Specification (WFS); OGC Catalog Service for Web (CS/W).

Week 12 (April 13): Sensor Web Technology and OGC Sensor Web Enablement (SWE) specifications (Dr. Genong Yu)

Week 13(April 20): Presentation and discussion of specification reviewed by each student.

Week 14 (April 27): Implementation considerations of the geographic information standards; GeoBrain, CropScape, VegScape, DEM Explorer, RF-CLASS

Week 15 (May 4): Where are the interoperability technologies heading (Classroom discussions). Also each student should give a short presentation about the topic of his/her semester paper.

The last day for turning in the semester paper: May 13.